September 1942

THE FOUNDRY

FIFTY-FIRST YEAR

TECHNOLOGY DEPT.

PUBLIC LIBRARY
SEP 1 - 1942
DETROIT

. . . . and Pierre thought HE *knew perfection*

Pierre may not be the name of your core-room foreman—but by any other name, your oven technique is due for a boost, once he samples

ROYAL BINDER

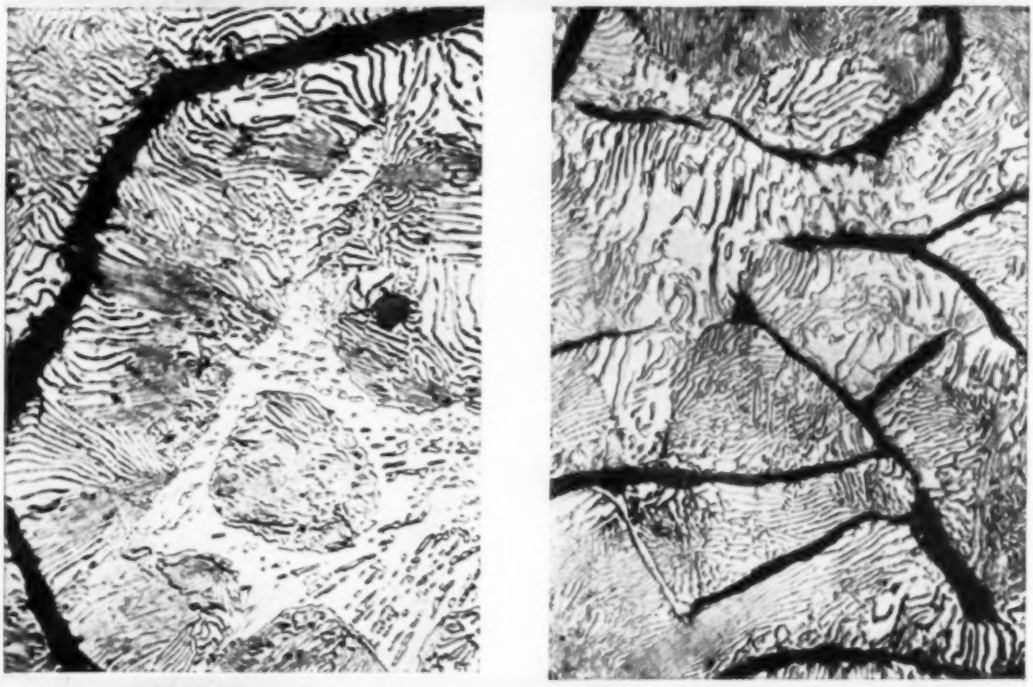
—the new Federal core binder that possesses just about every property essential to the ultimate in both *perfection* and *production* . . . Royal Binder INCREASES OVEN CAPACITY by reducing baking time; it SAVES OIL up to 25%. Royal Binder ADDS GREEN STRENGTH—making it easier and safer to handle green cores; it REDUCES SMOKE by not only reducing the oil content, but because Royal itself gives off practically no smoke. Royal Binder SAVES NAILS, SAVES CEREAL BINDERS—in fact, the general economies effected through Royal's consistent use will prove it one of your most versatile core-room necessities. We invite you to order a trial today!

THE FEDERAL FOUNDRY SUPPLY CO. 4600 EAST 71st ST. CLEVELAND, OHIO

CHICAGO • DETROIT • NEW YORK • ST. LOUIS • UPTON, WYO.
RICHMOND, VA. • CHATTANOOGA • MILWAUKEE • MINNEAPOLIS

Refining with PURITE *insures* CLEANER IRON AND STRONGER CASTINGS

The value of Purite in refining cupola cast iron is now generally recognized by progressive foundrymen and metallurgists everywhere. The refining is more than simply removing sulphur. Occluded gases are expelled by the boiling action set up by Purite and entrained oxide-silicates and other non-metallic impurities are washed out of the iron and carried off in the Purite slag.



Untreated — Treated

Photomicrographs of an all-scrap mixture cast iron at 1,000 X etched with 2 percent nital, before and after refining with Purite. See how Purite refining washes out manganese sulphide and complex silicate inclusions, breaks up the phosphide areas, reduces the size of graphite particles and produces a more uniform, dense structure iron.

Molten iron is always charged with gases and gaseous compounds as well as some non-metallic impurities, more or less varying with the character of the charge, melting practice and refinement of the metal in the hearth of the cupola or in the ladle. These tend to be squeezed out as the iron freezes in the mold, sometimes causing pinholes or gas pockets and segregated defects.

Purite reacts with non-metallic inclusions or silicates in molten cast iron, forming fluid soda slags which rise out of the iron. It combines readily with gaseous sulphur which is held in the Purite slag or is driven off, along with other gases, by the boiling action set up in the iron by Purite. Thus it is seen how refining with Purite, whether in the cupola hearth or in the ladle, increases the strength and improves the grain structure, soundness and machinability of iron castings.

Ask for new bulletin P41 "REFINING CAST IRON WITH PURITE"

THE MATHIESON ALKALI WORKS (INC.)

60 EAST 42ND STREET, NEW YORK, N. Y.

Wanted urgently:

STEEL SCRAP

Shortage of steel scrap is threatening the war-production program.

If ships, planes, tanks and guns are to be produced in the volume needed to win the war, the country's steel-making facilities must operate at full capacity. But the plain truth is that the steel scrap to support continued capacity operations is not available, and not in sight.

United Effort Will Do the Job

Thanks to the construction of new blast furnaces, the deficiency is being partly made up by using more pig iron in steel-making. But tremendous quantities of additional scrap must be found within the crucial next few months.

Actually, many thousands of tons of steel scrap are potentially available *if only they can be gathered in.* This scrap, needed so urgently in the war effort, is scattered through the industrial plants, mines and railways, the farms and the homes of the nation. The problem is to collect it and get it moving to the steel mills. Everyone must help. If everyone will, there will be scrap to meet the needs of the war-production program.

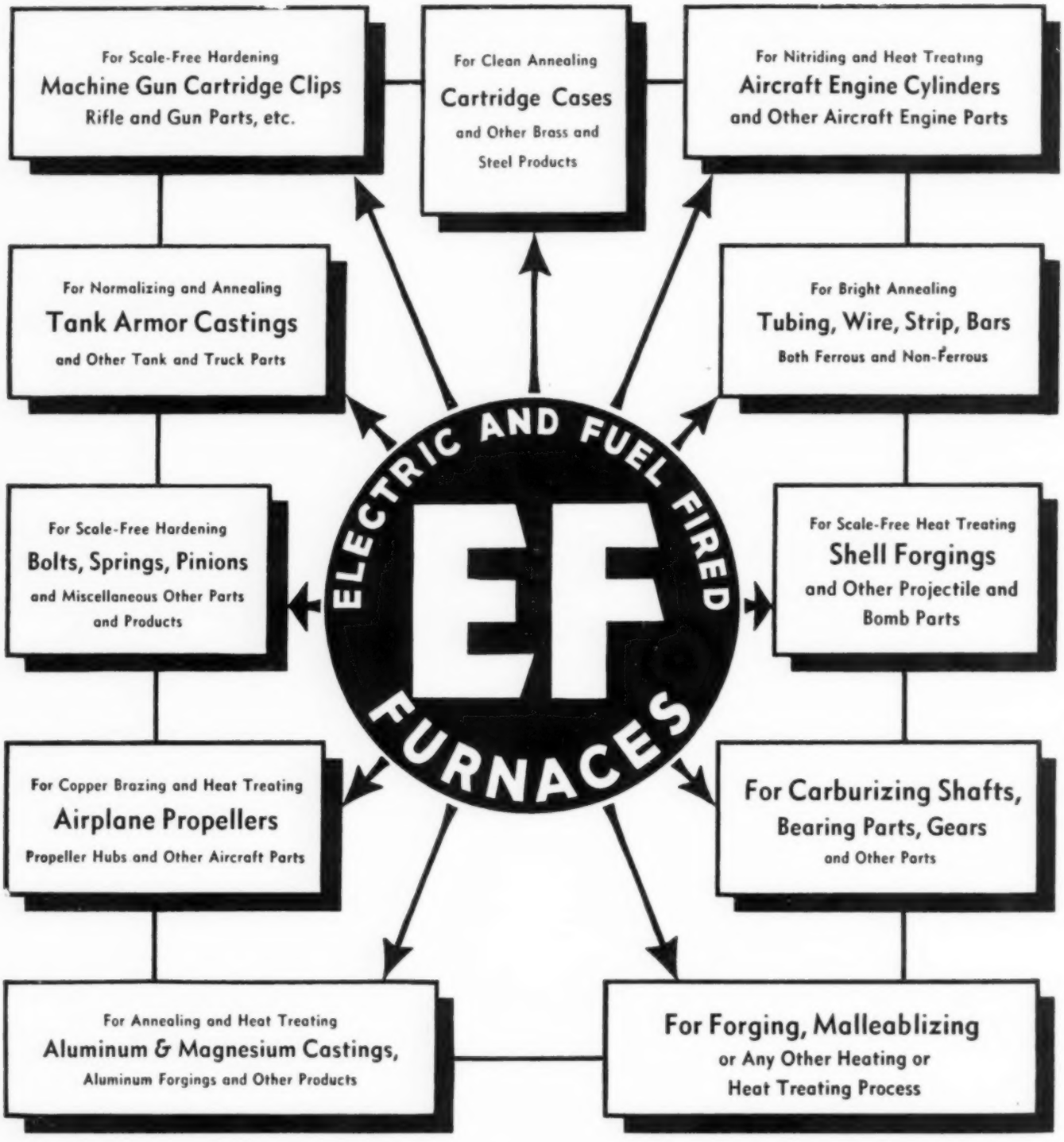
Make a checkup in your plant or warehouse, or any other property you own or manage, and in your home.

Have any odds and ends of steel or iron that may be lying around collected. If you have any obsolete or idle equipment, machinery, or parts—anything that's made of iron or steel and isn't really needed—junk it, and get the scrap moving toward the steel mills.

How to Put Your Scrap to Work

Some iron or steel now lying rusting and forgotten around your property may help to save the lives of Americans in the battle areas. Gather up every possible bit of iron and steel scrap. Sell it to a local junk dealer, or get in touch with your local scrap salvage committee. Put your scrap to work for your country. It's needed, now!

BETHLEHEM STEEL COMPANY



Increased production and uniformity; the saving of valuable time, labor and metals and other advantages have been effected by recent EF continuous automatic, semi-continuous and batch type furnace installations.

The Electric Furnace Co. specializes in designing and building production furnaces and time and labor saving material handling equipment. Years of practical furnace building experience have enabled EF engineers to develop some outstanding production furnaces for handling the above materials and many other essential war products.

Submit your production furnace problems to EF engineers.

The Electric Furnace Co., Salem, Ohio

Gas Fired, Oil Fired and Electric Furnaces---For Any Process, Product or Production

THE FOUNDRY

Contents

VOLUME 70
NUMBER 9

Editorial Staff

FRANK G. STEINEBACH
Editor

PAT DWYER
Engineering Editor

EDWIN BREMER
Metallurgical Editor

DON S. CADOT
Art Editor

VIRGINIA BRANDENBURG
Assistant Editor

New York . . . . B. K. PRICE
L. E. BROWNE
Chicago . . . . . E. F. ROSS
Detroit . . . . A. H. ALLEN
Pittsburgh . . . R. L. HARTFORD
Washington . . . L. M. LAMM
London . . VINCENT DELPORT

Advisory Staff

JOHN W. BOLTON
ALBERT E. GROVER
JOHN HOWE HALL
N. K. B. PATCH
HARRY A. SCHWARTZ

Business Staff

J. M. LATHROP
Advertising Manager
R. C. WELLMAN
Circulation Manager

New York . . . . J. F. AHRENS
Chicago . . . . . L. C. PELOTT
G. A. POPE
Pittsburgh . . . . . S. H. JASPER
R. C. WELLMAN
Cleveland . . . A. L. KLINGEMAN

MAIN OFFICE

Penton Building, Cleveland, Ohio

BRANCH OFFICES

New York . . 110 East 42nd Street
Chicago . 520 North Michigan Avenue
Pittsburgh . . . Koppers Building
Washington . National Press Building
Detroit . . . . 6560 Cass Avenue
London . . . . 2, Caxton Street
Westminster, S.W. 1.

THE FOUNDRY is published monthly by THE PENTON PUBLISHING CO., Penton Building, 1213 West Third Street, Cleveland, O. EARL L. SHANER, President and Treasurer; GEORGE O. HAYS, Vice President and FRANK G. STEINEBACH, Secretary

Subscription: In the United States and possessions, one year, $2.00; three years, $5.00. Single copies 25 cents. Copies published three months or more previous to date of current issue, 50 cents

Member: Audit Bureau of Circulations, Associated Business Papers, National Publisher's Association. Copyright 1942 by THE PENTON PUBLISHING CO.

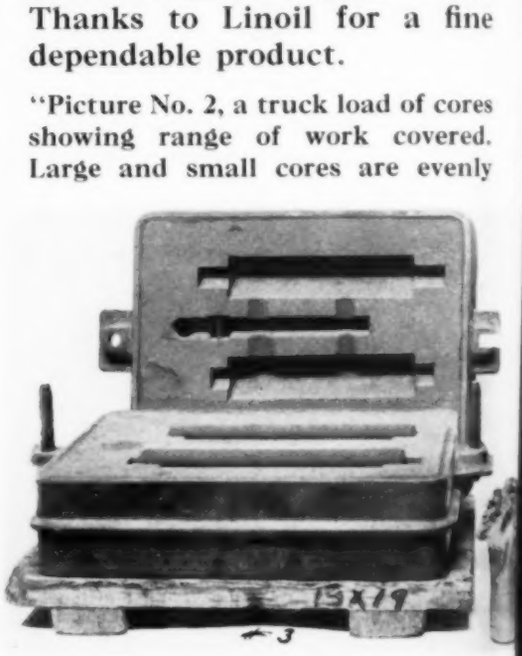
Entered as second class matter at postoffice at Cleveland under the act of March 3, 1879.

	PAGE
Editorial	73
Deep Finned Airplane Cylinder Heads Made on Production Line *By Edwin Bremer*	74
50 Years of Service to an Industry	78
The Metallurgist and the Steel Foundry *By Frederick A. Melmoth*	80
Great Britain Operates Foundries Under War Conditions *By Vincent Delport*	82
Malleable Foundry Keeps 'Em Rolling *By Pat Dwyer*	84
Casting Silicon Bronze Alloys	87
Converter Cast Steel Will Meet Requirements *By C. E. Sims and F. B. Dahle*	88
Questions and Answers	90
Men of Industry	96
Foundry Developments at Short Range	102
Develops Cupola Mixing Spout *By W. A. O'Brien*	104
New Steel Foundry Laboratory Speeds Analysis	108
The Adventures of Bill *By Pat Dwyer*	110
Among Detroit Foundries *By A. H. Allen*	114
Can You Answer the Questions When the Fireman Calls?	118
Keep The Snagging *By Chester Blake*	121
Comment	126
New Foundry Equipment and Supplies	129
Activities of Foundry Groups	136
Readers' Comment	144
Obituary	147
Foundry Activities	149
Where-to-Buy Directory	177
Reviews of Manufacturers' Literature	195
Index to Advertisers	210

"Linoil-the
says Schroeder

"YES SIR, Linoil does do a good job," declares Roy Schroeder, Foundry Instructor in the rapidly growing Washburne Trade School,—"Extreme designs such as the one in the core shown in picture No. 4 would cause most coremakers to put a few extra drops of oil on the small projecting point. This core was made from a regular run of core sand by a student who has spent but one day a week in the foundry since February and only about two of those days making cores. Can you get better results with green help? Thanks to Linoil for a fine dependable product.

"Picture No. 2, a truck load of cores showing range of work covered. Large and small cores are evenly



Are you letting Linoil help you in this production crisis? Efficient and effective operation of your coreroom thru the use of a dependable oil will result in a smaller percentage of scrap. No lost time in mixing and baking—therefore more cores—this means more bombs—more tanks, more guns, more Victories. Don't delay final Victory by using materials of unknown quality, guard against any bottle-neck in *your* plant from getting vital equipment to our boys—time saved now means more of our boys will be back and sooner to help rebuild a war-torn world. And then in peace and construction do not forget the oil that made production flow smoothly in bringing destruction to those who would destroy.

THEY CAN'T ALL BE WRONG
WHO SAY LINOIL IS RIGHT

ideal binder."
of Washburne

Foundry Instructor at Chicago's Famous Trade School Praises the Versatility and Dependability of the Logical Oil for Cores

LINOIL

baked—on the same rack, all retain clear sharp edges. The stock core which Dominic Restus has just handed to me is made of a special mixture of core sand which must be used in the production of magnesium castings. While the sand needs inhibitors so that the metal will lie quietly against the core, Linoil, as usual, is on the job as the ideal binder.

"Picture No. 3 is the mold for magnesium bomb casings—Note runner in cope with skim gate thru which metal must flow. This serves to hold back the oxides and quiet the flow of metal. Molds are not swabbed. The sand used is a silica sand of about 85 AFA Fineness—bonded with clay, while inhibitors (sulphur, boric acid, etc.) are added to prevent blowing and oxidation. To the right is a machined casing and what is left after the experiment conducted by the Chicago Fire Department.

"A final inspection of molds to be poured before taking off the heat is shown in picture No. 5. Metals poured in the Washburne Trade School Foundry are gray and alloyed irons, brass, bronze, aluminum and magnesium. The castings are used in the training of Smith-Hughes students, machinist apprentices and National Defense trainees. Repair parts for school machines are also made. Linoil is used throughout."

BUY MORE WAR BONDS

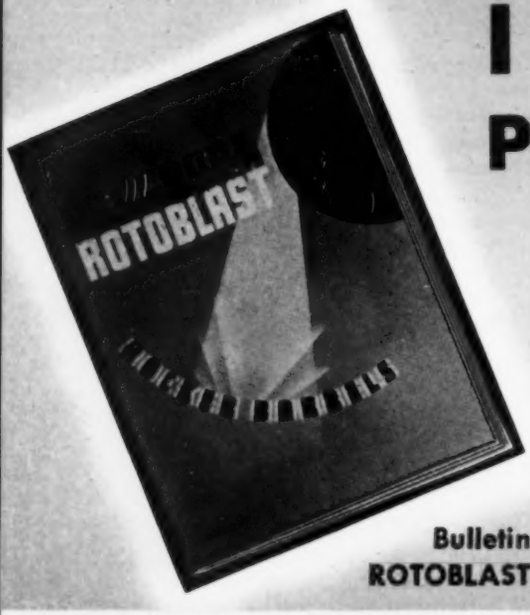
THE WERNER G. SMITH COMPANY

(DIVISION OF ARCHER-DANIELS-MIDLAND COMPANY)

2991 West 110th Street — Cleveland, Ohio

ROTOBLAST

IF YOU NEED PANGBORN AIRLESS



Bulletin on
ROTOBLAST Barrels

Day and night--PANGBORN Blast Cleaning Equipment is ON ACTIVE DUTY! The efficiency of every unit we make is dedicated to the one fact that WE HAVE A WAR TO WIN--and only the continuous production of MORE PRODUCTS, IN LESS TIME--WITH LESS WASTE--will win it!

WORLD'S LARGEST MANUFACTURER OF BLAST

PANG

PANGBORN CORPORATION . . . . . .

"CLEANS FAST"

PRODUCTION, EQUIPMENT *delivers it!*

ROTOBLAST Barrels, Tables and Special Cabinets are doing a record smashing job in cleaning shells, bombs, all kinds of castings, heat-treated parts, forgings, armor plate, tank parts, etc. We can help you too! Write or wire.

Bulletin on ROTOBLAST Tables

CLEANING AND DUST CONTROL EQUIPMENT

BORN

. . . . . HAGERSTOWN, MARYLAND

"I'm replacing every machine with Champion"

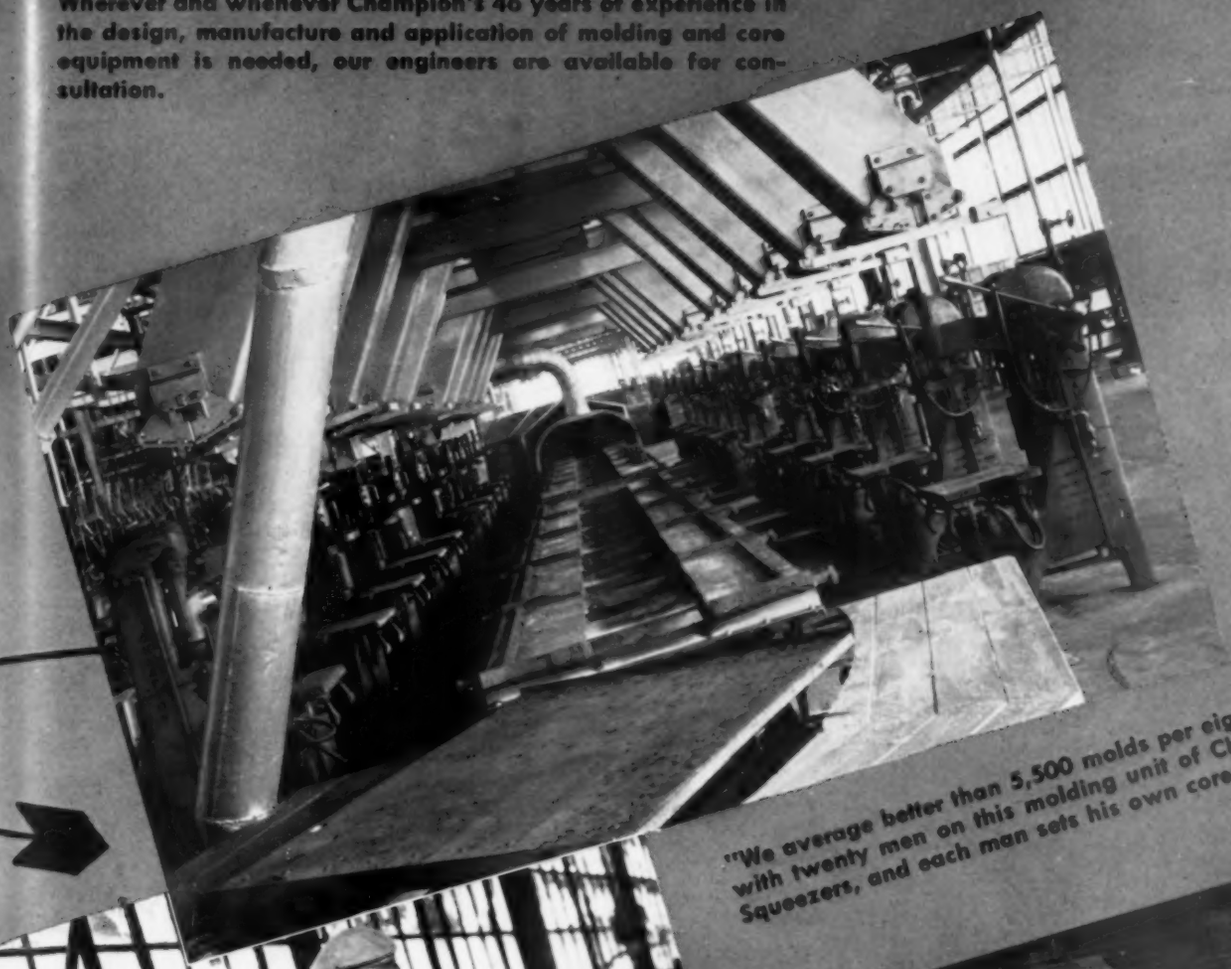
The man in the shop knows the real story of Champion advantages —safety, economy and capacity— improved castings, more molds, less scrap, and molders who stay on the job because they like to work with a Champion.

The accuracy and dependability of this modern method meets the most exacting needs of the smallest jobbing foundry or the largest production shop because it is the product of experience—designed and built by engineers who have spent their lives in America's foundries. Every Champion equipment is unconditionally guaranteed to do its job faster and better; to meet your most exacting needs.

"I've been in the foundry game 36 years and used all types of machines but Champion tops them all, and I'm replacing every machine with Champions as soon as I can."

CHAMPION

Wherever and whenever Champion's 46 years of experience in the design, manufacture and application of molding and core equipment is needed, our engineers are available for consultation.



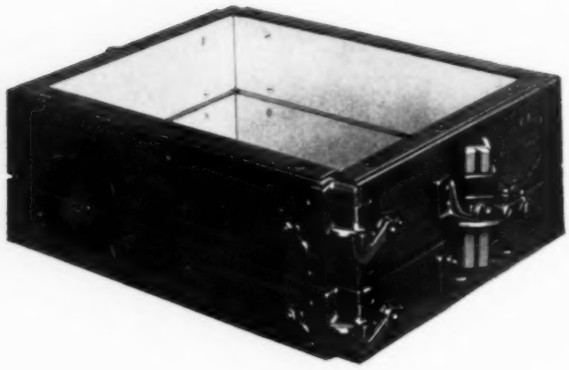
"We average better than 5,500 molds per eight-hour day with twenty men on this molding unit of Champion Jolt Squeezers, and each man sets his own cores."

"We've doubled our production on this job with the new Champion Jolt Squeeze Push-off Machine as compared to our production on previous machine equipment, using the same flask and pattern plate."

"That Champion Jolt Squeezer has lots of power and pep, and I like that idea of having the squeeze valve over head, it helps make the day's work easier. It sure is a pleasure to work with the Champion."

FOUNDRY & MACHINE CO.

1318 WEST 21st STREET, CHICAGO, ILLINOIS



ADAMS CHERRY SNAP FLASK

Custom-built, any desired size, with straight sides or any desired taper. Wide-V, double-V or round pins—triple-locking snaps or lever latches. Trimmings fully adjustable to compensate for wear.

ADAMS CHERRY SLIP FLASK

A very convenient flask for machine or bench, made to your dimensions. Wide-V, double-V or round pins. Dependable and easily operated sand strip mechanism.

ADAMS CAST IRON JACKET

The patented construction of this jacket, involving a combination of horizontal and vertical ribs and machined corners, provides maximum rigidity with minimum weight. Any size, straight or tapered.

ADAMS STEEL JACKET

The strongest and most rigid jacket on the market, to effectively handle the most difficult jobs. Made in any desired size, straight or tapered.

THE ADAMS COMPANY

MOLDING MACHINES · FLASK

This is what
Adams Jolt Squeezers
will do for you!

They Will Reduce Production Costs. They are efficiently designed with a minimum number of working parts, and controls are accessible for quick handling.

They Will Assist in Reducing Losses. Close control of jolting and squeezing operations assures the production of uniform molds.

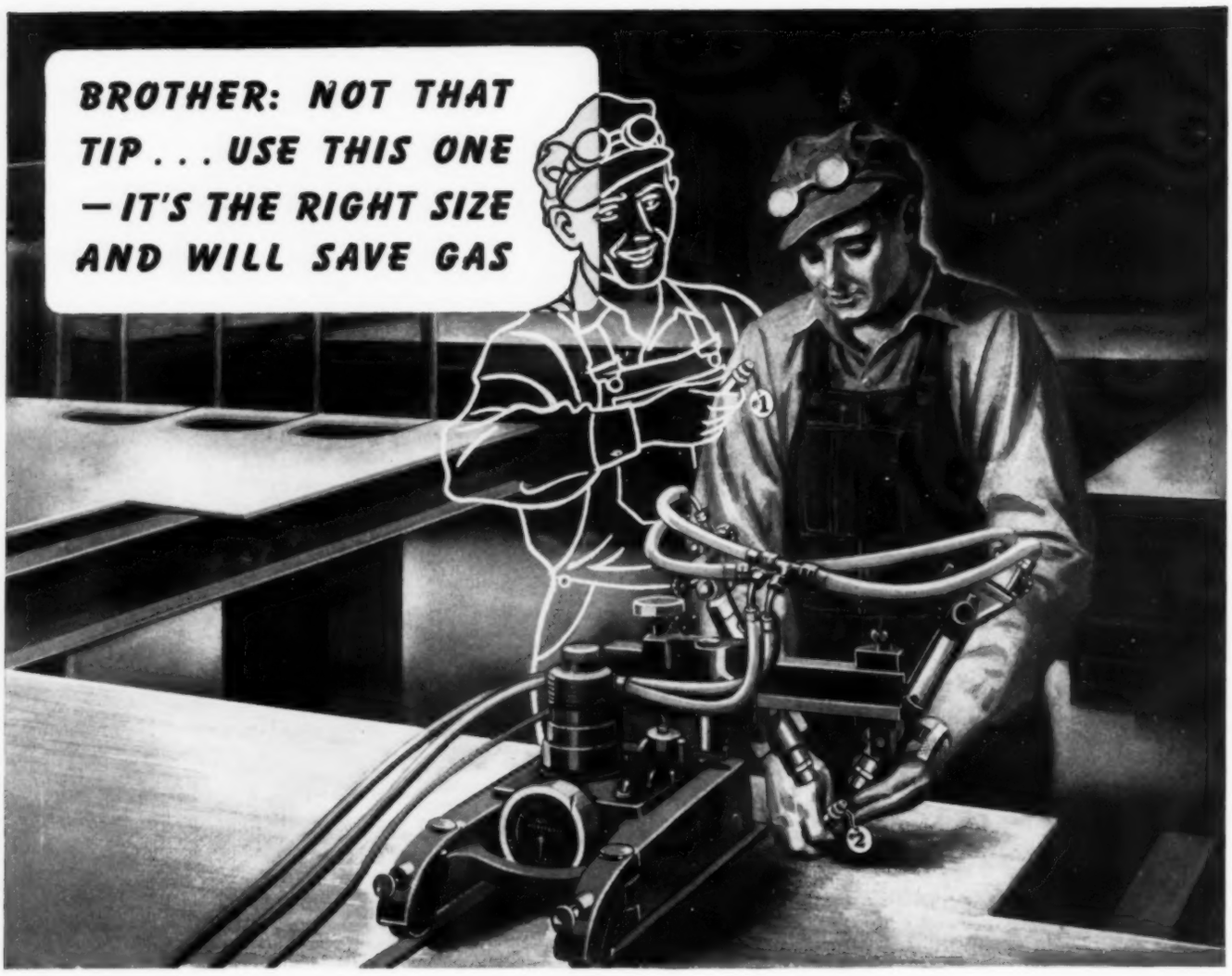
They Will Help to Maintain Uninterrupted Production. Simple design and durable construction provide insurance against production delays.

They Solve the Skilled Labor Shortage. Their operation has been so simplified that no special skill is required to operate them successfully.

Adams Jolt Squeezers are made in both Side Rod Type and Post Type, with 10" or 12" cylinder, stationary or portable. Same sizes available in Jolt-Squeeze-Pattern-Draw machines.

NY · DUBUQUE, IOWA · U.S.A.

K EQUIPMENT *Established 1883*



NEVER USE OVERSIZE TIPS

Of course you know that the larger the tip, the more oxygen and acetylene it uses. But did you ever stop to realize how wasteful an oversize tip can be. For example, a No. 2 tip instead of a No. 1 for cutting ½-inch steel plate wastes 10 to 20% in oxygen, approximately 16% in acetylene — wastes gas badly needed to build ships, tanks, guns and planes.

Be sure you and your men use every cubic foot of oxygen and acetylene to best advantage. Let's every one of us be our own Waste Warden — fight waste to speed victory.

THE WASTE WARDEN *says:*

DO close cylinder valve after use.
DO check your hose and connections for leaks.
DO keep your cylinder inventory low and return empties promptly.
DO keep tips clean and free from carbon and slag.

★ ★ ★

DON'T use excessive pressure.
DON'T use oversize tip.
DON'T leave torch burning when not in use.
DON'T abuse cylinders.

Air Reduction

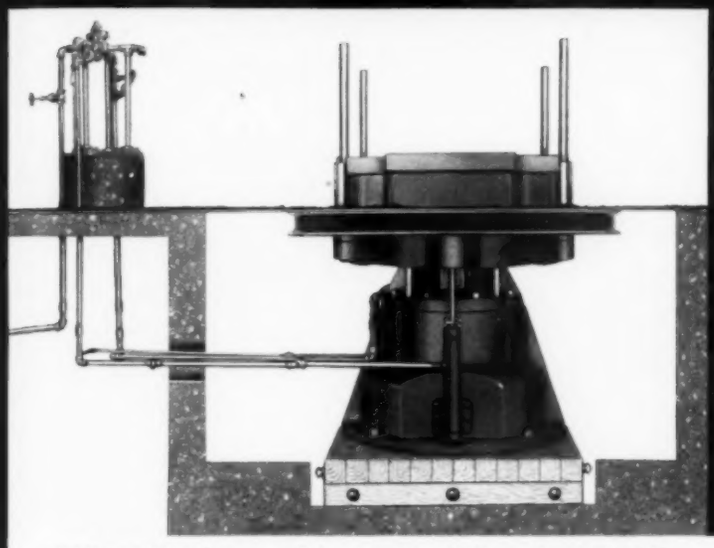
General Offices:
60 EAST 42nd STREET, NEW YORK, N. Y.
IN TEXAS
MAGNOLIA-AIRCO GAS PRODUCTS CO.

AIRCO

WILSON

IDLE CYLINDERS ARE PRODUCTION SLACKERS: *Keep 'em rolling for victory!*

TOUGH FOUNDRY PRODUCTION *calls for fast efficient* COPE MACHINES



"DAVENPORT" PIN LIFT JOLT-STRIPPER

Usual pit installation necessary for larger models on which customary stripping plates can be eliminated. Compact, sturdy, easy to install, maintain and operate.

"DAVENPORT" PIN LIFT JOLT-STRIPPER

Known as a cope machine, however, drag molds can be made equally as well—in many cases. Unskilled men can produce exceptional results.

"DAVENPORT" PIN LIFT JOLT-STRIPPER

Pit type machine showing cope of a large Diesel engine clutch housing being made on a No. 40 AJS model.

"DAVENPORT" PIN LIFT JOLT-STRIPPER

Stationary floor type with lifting pins in raised position.

"DAVENPORT" PIN LIFT JOLT-STRIPPER

Portable type with lifting pins in lower position.

Write today for our new catalog featuring "Davenport" Molding Machines

Davenport Machine and Foundry Co.

Davenport Iowa

America is dotted with Hydro-Blasts

Sand and water delivered against the casting at 1,200 pounds pressure, and 3 miles per minute velocity. Hydro-Blast quickly returns your investment through washing, drying and recovering for re-use sand that is now wasted.

America's *war important* industries are cleaning steel, gray iron, malleable, magnesium and other non-ferrous castings with the Hydro-Blast wet sand and water system because no other means or method provides the same economies and advantages. Hydro-Blast cleans castings cleaner, knocks out the most complex cores, provides more healthful working conditions, permits closer sand control, and recovers core sand for re-use in better than new condition.

The many million tons of foundry sand recovered annually by Hydro-Blast for re-use save many millions of freight ton miles which are so vital to victory. It is easy for you to figure the cost of your silica sand from point of origin to your dump. When you recover more than 80% of your presently wasted sand, you reduce your production costs immeasurably and provide your Country with much needed transportation facilities.

HYDRO-BLAST Corporation

2550 N. WESTERN AVE., CHICAGO

California: *Oakland, Sunnyvale;* **Connecticut:** *Bridgeport;* **Kentucky:** *Louisville;* **Illinois:** *Granite City; Rockford;* **Indiana:** *Gary, E. Chicago 2;* **Michigan:** *Bay City, Dearborn 5;* **Missouri:** *St. Louis;* **New Jersey:** *Harrison;* **New York:** *Depew, Olean, Seneca Falls, Schenectady, Brooklyn;* **Ohio:** *Elyria 3, Cleveland, Dayton, Minster, Toledo;* **Pennsylvania:** *S. Philadelphia, Waynesboro, Franklin, Pittsburgh;* **Wisconsin:** *Milwaukee 2, Madison, Beloit, Kaukauna;* **Washington, D. C.;** **Canada:** *Orillia, Ontario; Lachine, P. Q.*

This AO Goggle meets the Tests of SAFETY and of COMFORT

The pliable, snug-fitting leather mask . . . the wire screen ventilation around the large eye cups . . . the Super Armorplate lenses that provide invaluable protection against impact and the adjustable one-piece headband are a few of the reasons why the N. F. A. and N. A. S. O. Goggles supplied by American Optical Company meet the requirements of the men in the foundry for safety and comfort. Goggles equipped with Cabobar Super Armorplate lenses can also be obtained from American Optical for those who require protection from glare.

N. F. A. and N. A. S. O. Goggles are supplied directly to you by American Optical Company. Get in touch with your nearest AO branch office today.

American Optical

COMPANY

SOUTHBRIDGE, MASSACHUSETTS

For Intricate Aircraft Castings

Juniata

The UNIVERSAL FOUNDRY SAND

Juniata bank sands are more than proving all performance claims both for cores and molds in leading nonferrous, gray iron and malleable foundries throughout the United States and Canada.

IN MOLDS:	IN CORES:
Highly Refractory	Free Flowing
Permits Hard Ramming	Saves Binders
Gives Sharper Profile	Resists Sagging
Bonds Adhere Readily	Smoother Surface
Ideal Facing Sand Base	Highly Permeable
Rapid Mixing or Mulling	No Metal Penetration
Uniform Grain Distribution	No Clay or Lime Defects

A Great Lakes Metallurgist or Sand Technician will, without obligation, make recommendations as to how Juniata Sands will improve your castings and reduce losses.

Great Lakes has in continuous operation five different bank sand properties from which sands ranging from 60 to 140 A. F. A. grain fineness are shipped.

These magnesium alloy aircraft engine castings are cast in Juniata bank sand cores and molds.

Great Lakes
FOUNDRY SAND COMPANY—DETROIT

MINERS • PROCESSORS • FOUNDRY, METALLURGICAL AND SAND BLAST SERVICE

FOUNDRY SANDS • SILICA SANDS
SHOT—GRIT—BLAST SANDS
REFRACTORIES • BENTONITE
RE-BONDING CLAYS

Incendiary Bombs FROM SEA WATER

BUELL DUST RECOVERY SYSTEMS PLAY AN IMPORTANT PART

The sea is a limitless source of magnesium—the "miracle metal" that's both fire for incendiary bombs and lightness and strength for the bombers that drop them.

Extracting millions of pounds of magnesium from sea water is the big job of one of America's biggest chemical producers. Details, of course, are secret, but Buell Dust Collectors play an important part here as elsewhere in

CHEMICAL & PROCESS INDUSTRIES
ROCK PRODUCTS INDUSTRY
FOUNDRIES
POWER PLANTS
METALLURGICAL AND OTHER INDUSTRIES

With the patented van Tongeren cyclone (an exclusive feature of Buell Dust Recovery Systems) no extra draft loss or power consumption is necessary to achieve extra collection efficiency. Buell Systems have no filters to replace and large openings prevent clogging. Installations can be made for any capacity from 300 c.f.m. up, in arrangements of units to suit individual space and efficiency requirements. Buell engineers are at your service, wherever you are located.

DOUBLE EDDY says: *"You'll find the complete story of Buell's patented van Tongeren cyclone in* BULLETIN F-9. *Write for it!"*

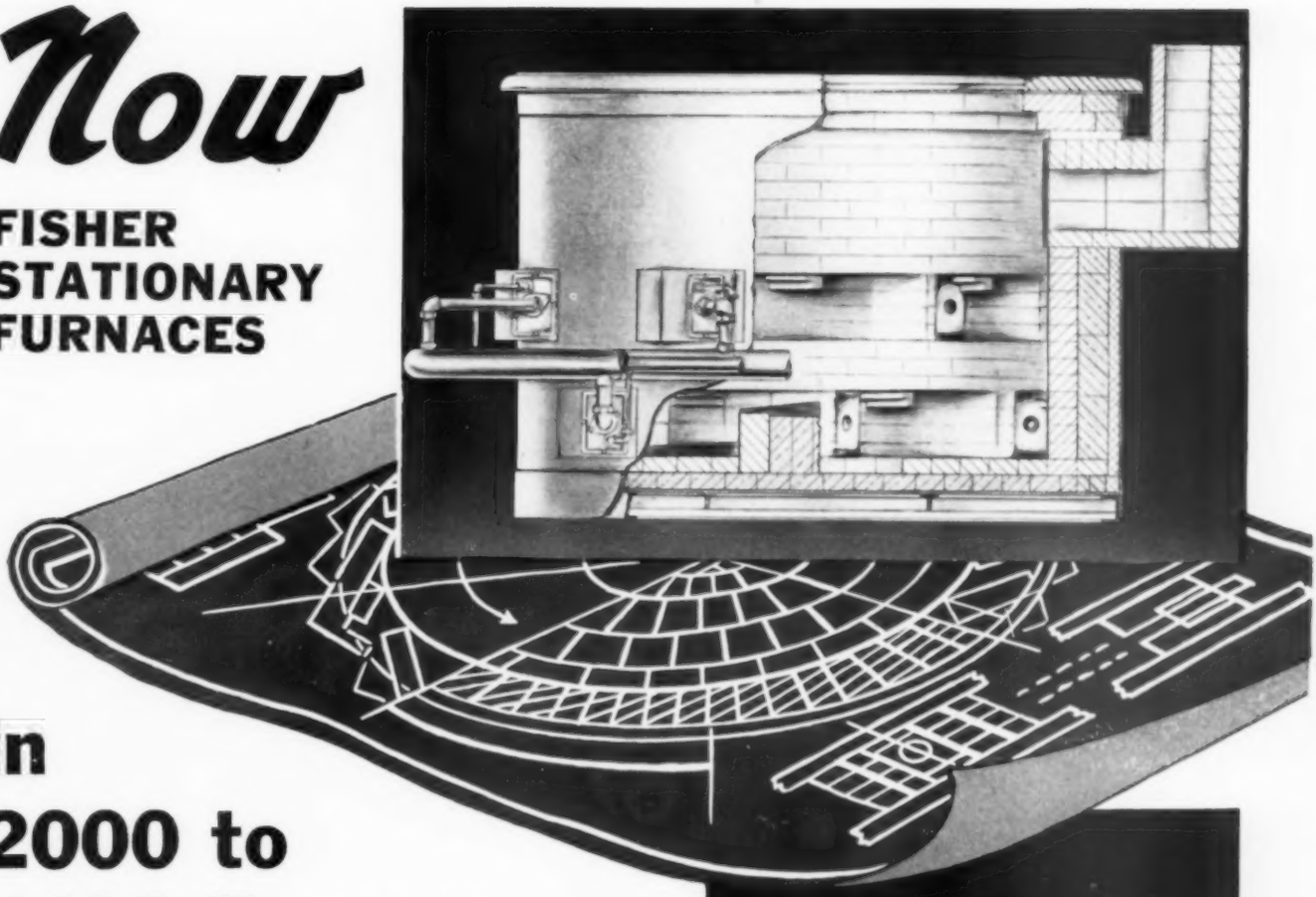
BUELL ENGINEERING CO., Inc., *14 Cedar Street, New York*
Sales Representatives in Principal Cities

CONSULT BUELL *First* IN DUST RECOVERY
for Chemical • Rock Product • Metallic • Food • Flue or any other dusts

buell
DUST RECOVERY SYSTEMS

Now

FISHER STATIONARY FURNACES



in 2000 to 4400 lb. CAPACITIES

- Maximum temperature uniformity.
- Multiple, low capacity burners staggered in two banks.
- Half upper and half lower banks operated by each of two proportional mixers, maintaining controlled proportional atmosphere thru full turn-down range of 5 to 1 with all burners operating and ultimate 10 to 1 turn-down using only half of the total number of burners.
- Furnace design, plus burner control increases service hours of steel pots.

Request complete information on this new Fisher Furnace. Consult Fisher on Foundry layouts for increased production.

• • in MAGNESIUM

This new addition to the broad line of Fisher Melt-down, Holding and Alloying Furnaces presents construction and engineering features that have been thoroughly proved by Fisher Furnaces thru many years, plus new developments that are designed to meet present demands for MORE PRODUCTION. Multiple burners are arranged in staggered positions in two levels permitting the use of low capacity burners and preventing localization of heat in the combustion chamber with the result of extreme temperature uniformity. Gas or oil-fired.

1742 NORTH KOLMAR AVE., CHICAGO, ILLINOIS

Fisher FURNACE COMPANY

MACKLIN
GRINDING WHEELS

MACKLIN COMPANY

Manufacturers of GRINDING WHEELS — JACKSON, MICHIGAN, U. S. A.

Distributors in all principal cities

Sales Offices: — Chicago - New York - Detroit - Pittsburgh - Cleveland - Cincinnati - Milwaukee - Philadelphia

Airplane attack—U.S. Army Signal Corps Photo

Battling the Enemy-Dust!

Cutaway operating view of a Schneible Senior Multi-Wash Dust Collector Tower.

Dust is a worse saboteur in your plant than any fifth columnist could be — for it works against you during every operating hour. Fortunately, it can be licked and with comparative ease. Ventilate all dust creating operations, sandblast rooms, shakeouts, sand conditioning, and core grinding. Install a Multi-Wash dust collector of proper size with suitable dewatering equipment. From then on, operation is automatic. Nothing to clean or maintain; only water is used, over and over, as the cleaning medium. Fines are removed, heat is reduced, benefitting your sand, working conditions are greatly improved and maximum production, so essential to the present day war program, is made possible.

Cooled sand, so essential to the successful operation of continuous pouring systems, is assured by the proper application of Multi-Wash Dust Collectors.

Schneible dust, fume and odor control equipment is made in standard, inter-related units that can be arranged to suit any foundry operating condition.

Let us give you facts on what others are saving with Schneible Dust Control Equipment.

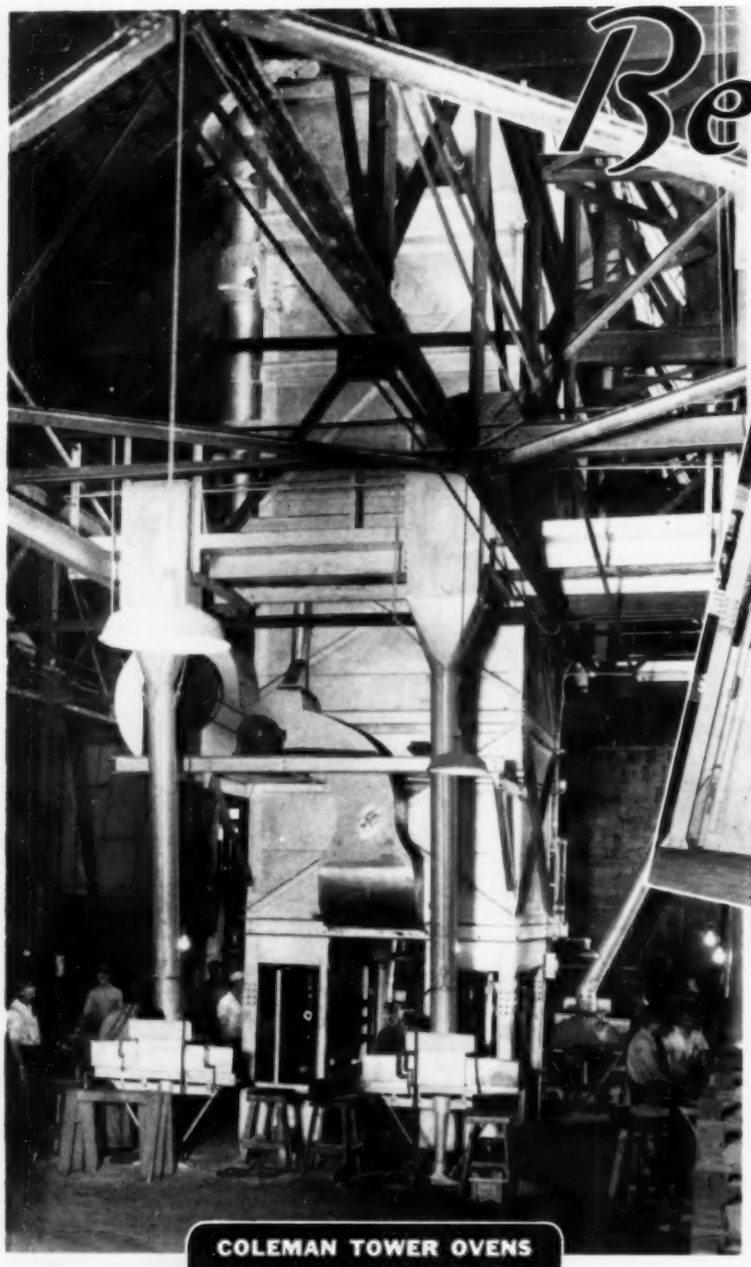
CLAUDE B. SCHNEIBLE COMPANY

3953 Lawrence Ave., Chicago

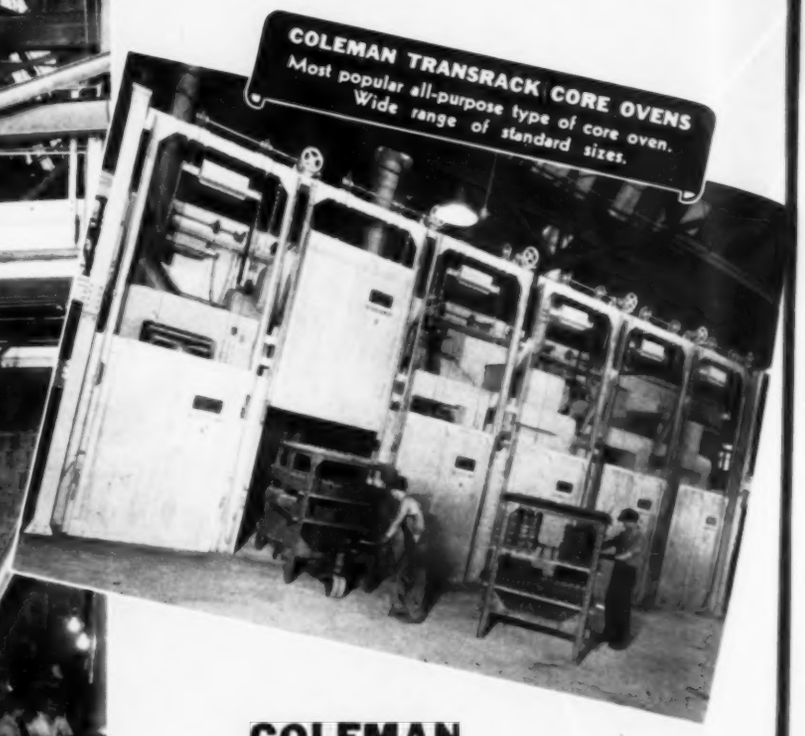
Offices in Principal Cities

SCHNEIBLE

Better Cores—



COLEMAN TOWER OVENS
Amazing production with these high-speed continuous ovens.



COLEMAN TRANSRACK CORE OVENS
Most popular all-purpose type of core oven. Wide range of standard sizes.

COLEMAN OVENS

Built in the following types—and for any fuel.

- PORTABLE
- ROLLING DRAWER
- TRANSRACK
- CAR
- TOWER
- HORIZONTAL CONVEYOR

COLEMAN

Faster and Cheaper with COLEMAN OVENS!

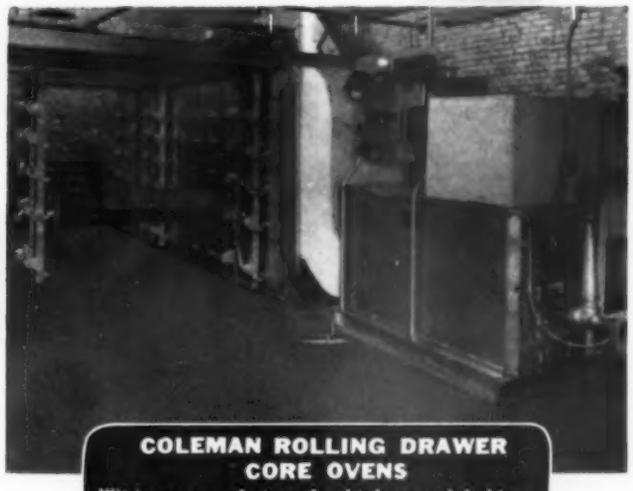
Over 6,000 Installations

Increased foundry schedules are demanding more and more cores. To avoid make-overs and eliminate casting rejects, these cores must be baked right! Coleman Ovens insure perfect baking--in addition they do this job faster and at lowest cost for fuel and labor.

For over 36 years, we have specialized in the design and construction of fast, efficient and economical core and mold ovens. This, together with the experience gained in building over 6,000 installations, is the reason for the outstanding preference of leading foundries for Coleman Ovens.

THE FOUNDRY EQUIPMENT CO.
BUILDERS OF COLEMAN AND SWARTWOUT OVENS
CONTRACTING ENGINEERS AND MANUFACTURERS
CLEVELAND, OHIO

COLEMAN CAR TYPE CORE OVENS
For all classes of heavy and medium cores.

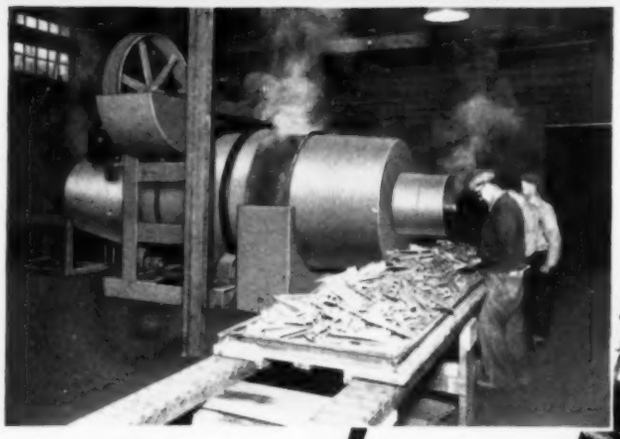


COLEMAN ROLLING DRAWER CORE OVENS
Wide range of sizes for high speed baking of medium and small cores.

CORE and MOLD OVENS

RANSOHOFF TUMBLING MILLS

. . speedy. . . gentle
. . . low maintenance costs
. . . automatic
handling of stars



THE RANSOHOFF METHOD EXCELLS because:

It CASCADES the castings in a *mass* in which stars are thoroughly intermingled, filling the voids completely. *Result:* very rapid cleaning without nicking, breakage or excessive mill wear. Stars enter and return automatically.

THE PRINCIPLE IS *Different* THE RESULTS ARE FAR *Superior*

A far cry from the primitive methods in which castings were cleaned by mixing them with iron scraps and leather pieces . . . for in the RANSOHOFF TUMBLING MILL you have the most scientific process which insures thorough cleaning in the quickest time without excessive mill wear.

For small or large castings . . . with every assurance that they will emerge clean, unbroken and with every line distinct . . . and without the health hazards formerly so prevalent.

IDEAL

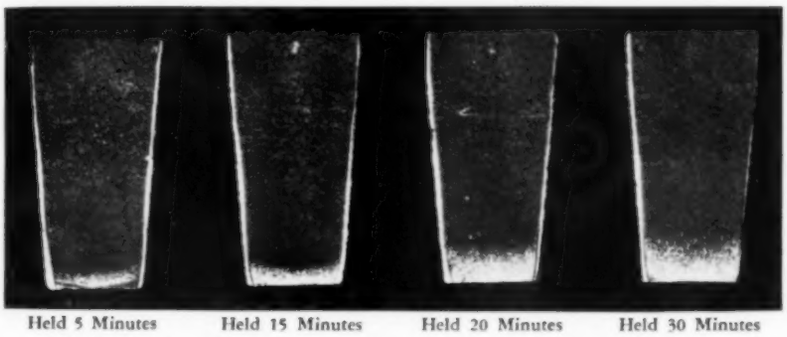
ASK THE RANSOHOFF ENGINEERS for the right answer to your problems.

Write Dept. F

N. RANSOHOFF, INC. CINCINNATI, OHIO

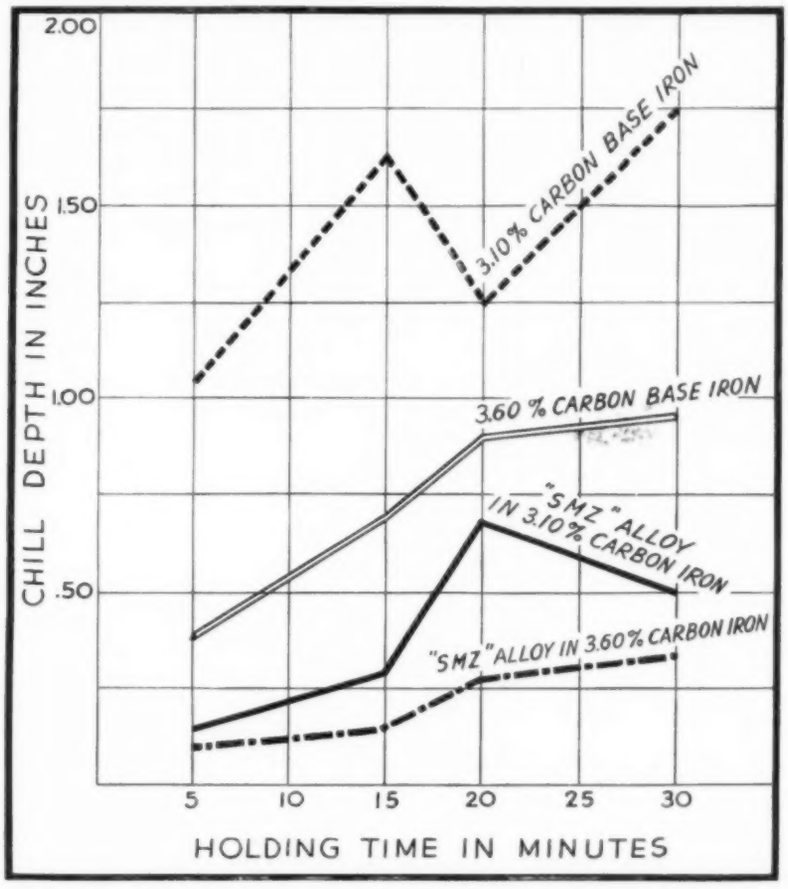
TOWNSHIP and BIG FOUR R. R.

"SMZ" ALLOY *Retains Graphitizing Power When Iron Is Held in the Ladle*



Held 5 Minutes Held 15 Minutes Held 20 Minutes Held 30 Minutes

Chill Blocks of 3.60% carbon iron treated with "SMZ" alloy.



Effect of holding time on chill depth in 3.10% carbon and 3.60% carbon irons untreated, and irons treated with "SMZ" alloy.

ADDITIONS of small amounts of "SMZ" alloy to cast iron in the ladle improve the strength, ductility, and shock-absorbing properties of the iron. Recent tests on 3.10% carbon and 3.60% carbon irons—chill blocks and graphs are shown at the left—indicate that iron treated with "SMZ" alloy and held in the ladle as long as thirty minutes is still satisfactorily graphitized.

Because "SMZ" alloy is a balanced alloy containing silicon, manganese, and zirconium, it produces iron of uniform structure and improved physical properties. By reducing the depth of chill, machinable iron is obtained even at the edges and corners and in thin sections. By using ladle additions of "SMZ" Alloy, foundries can readily make a high-strength cast iron from low-carbon, low-silicon iron.

Our metallurgists will be glad to discuss with you the advantages of "SMZ" alloy and how it can improve your iron. They can also tell you about the many other "Electromet" ferro-alloys and give you practical help in using them to obtain better iron. There is no charge for this service.

ELECTRO METALLURGICAL COMPANY
Unit of Union Carbide and Carbon Corporation
UCC
30 East 42nd Street, New York, N. Y.

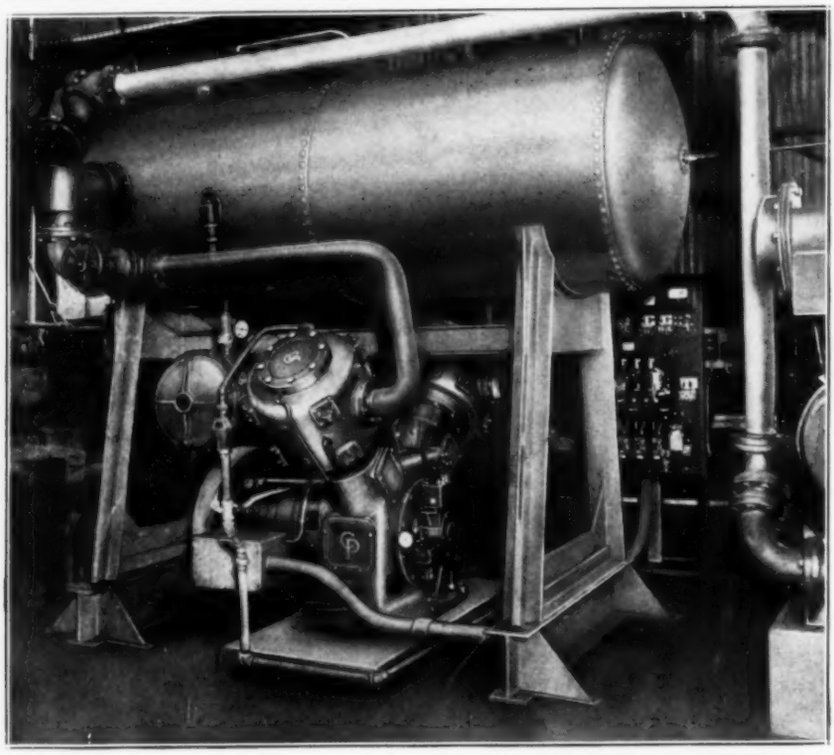
"Electromet" and "SMZ" are registered trade-marks of Electro Metallurgical Company.

Electromet
Trade-Mark
Ferro-Alloys & Metals

Distributed through offices of Electro Metallurgical Sales Corporation in Birmingham, Chicago, Cleveland, Detroit, New York, Pittsburgh, and San Francisco. In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario.

★ ★ ★ ★ CHICAGO PNEUMATIC NEWS ★ ★ ★ ★

150 HP COMPRESSOR WITH MOTOR, ONLY 7'8" x 5'0"



CP TYPE Y COMPRESSOR SOLVES PROBLEM OF LIMITED SPACE

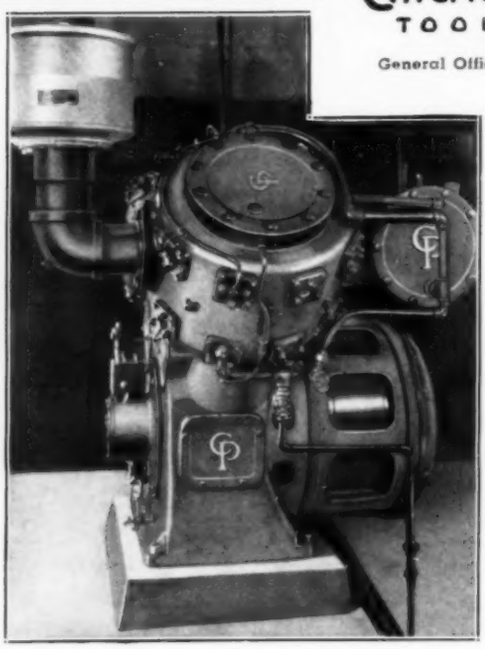
Shipped Intact, Quickly Installed

ALABAMA (CP) — A southern manufacturer had a CP horizontal O-CE air compressor. Production called for more air, but floor space was limited. A CP Type Y two-stage, double-acting 150 h.p. compressor gave him the needed 900 c.f.m. Shipped intact, the CP "Y" was quickly installed and required a space only 7' 8" long, 5' 0" wide, 5' 5" high, including built-in motor. Large valve area, multi-step regulation, effective intercooling and other features, insure efficient, dependable performance.

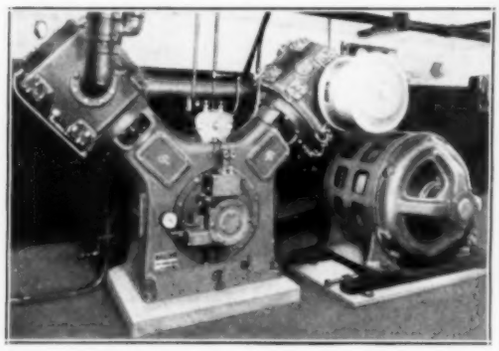
CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 8 E. 44th St., New York, N. Y.

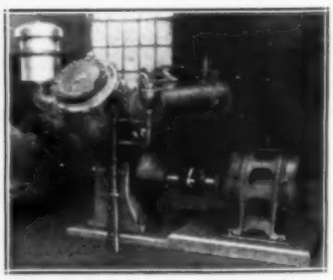
↑ **COMPACT.** This 150 hp. CP Type Y Air Compressor, 900 c.f.m. capacity at 100-125 lbs., with built-in direct-drive synchronous motor, takes less than half the space required by the same capacity horizontal compressor which it supplements. Proportions of compressor permit mounting of air receiver directly overhead.



← **SMALL FLOOR AREA** and simple foundation needed for this CP built-in drive Type Y Air Compressor are clearly shown; as is simplicity of design. Write for Bulletin 766.



↑ **TYPES AND SIZES.** CP Type Y double-acting compressors are available in capacities of 501 to 900 c.f.m. for 100-125 lbs. discharge pressure for sea level service. Sizes for other pressures also available.



↑ **ADAPTABLE TO MANY TYPES** of drives — built-in electric motor, coupled motor (as illustrated) or other prime mover, or belt wheel.

CHICAGO PNEUMATIC

AIR COMPRESSORS

ALSO: Pneumatic Tools, Electric Tools, Rock Drills, Hydraulic Aviation Accessories, Diesel Engines

PORTABLE
STATIONARY
AIR OR GAS
MOTOR DRIVEN
STEAM DRIVEN
DIESEL ENGINE
DRIVEN

CORE WASTE HAS BEEN CHEATED
NOW SEE HOW THEY'RE TREATED!

"Torrid" Campaigns against Core Waste

They called me a reprobate in every foundry, a saboteur if there ever was one. I burned cores, spoiled castings —in fact, I gummed up the works plenty.

But that was another day, thanks to the lesson I learned from Despatch engineers. Right now I'm doing a big job helping to make weapons for our boys—and I'm proud of it.

From the moment a fresh load of cores is released to my care, I give each one my personal attention. I wrap every core snugly in a blanket of evenly heated air during its stay with me to assure its future in the casting room.

As each load is pulled out, I watch the inspector put "OK" on every core; and that means I'm batting 1000 per cent. . . Now, watch out, you Japs!

"Torrid"

UNIFORM CORES AND MOLDS ASSURED

Ferrous and non-ferrous foundries alike have discovered the benefits from Despatch designed foundry ovens. The unique heat control system and careful distribution of heated air through every spot in the load and every inch of core surface assures the desired result. This control permits the perfect baking of cores and provides maximum speed-up of baking cycle.

In times like these we must have quality as well as speed. Investigate Despatch foundry oven design, particularly the specially arranged ovens for baking magnesium cores.

WIRE or PHONE—A Despatch engineer will recommend the proper foundry oven to suit your plant. Ask him for Bulletin No. 31. It contains diagrams of new designs and photos of important foundry installations.

DESPATCH
OVEN COMPANY MINNEAPOLIS

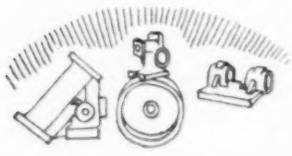
GRAPHIDOX #4

FOR HIGH-CARBON LOW-SILICON IRONS

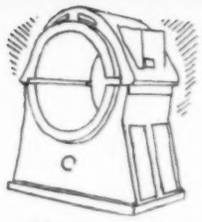
Wartime foundry problem: to produce castings of widely varying section from a single mixture.

Normally, an average hardness would be selected for the mixture, alloy additions being used to harden the heavy sections and soften the light ones. Today, however, hardening alloys are only available under high priorities.

So, for most jobs, the foundryman has to work from a mixture on the hard side from the standpoint of Carbon and Silicon, softening the various ladles as necessary to fit the work poured.

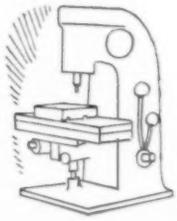


Using materials available, a mixture relatively high in Carbon and consequently low in Silicon can generally be planned. This will usually develop the required hardness. Moreover, because the higher Carbon (as well as low Silicon) tends to reduce shrinkage, there is a saving in foundry scrap.



However, the cupola product is extremely sensitive to section size.

Graphidox #4 is highly effective in overcoming this sensitivity and developing good machinability in iron of this composition. Graphidox #4 is potent both in keeping the iron clean and efficient in removing chilled edges. Other results: more uniform hardness from edge to center; much improved resistance to wear and heat checking; freedom from dendritic patterns; tensile and transverse strengths far above average for the Carbon-Silicon composition.



VANADIUM CORPORATION OF AMERICA · NEW YORK, N.Y. FERRO-ALLOYS

Continuous Mold Conveyors

many types—for every requirement

• Loaded as they pass the molder's stations—then continuing past the pourers, along the cooling zone to the shakeout, and around again in an endless cycle—Bartlett-Snow Mold Conveyors provide foundry owners and managers with a means of securing a maximum of both quality and quantity from their plants.

With a continuous mold conveyor sand can be reused three, four or more times a day. Flasks can be used over again eight to twelve times each shift. Output per given floor space is much increased. "Overhead" is spread over a larger production resulting in a less costly, more salable product.

Bartlett-Snow two wheeled single axle "cars", supported in part by the axle end of the next adjoining car, and four wheeled two axle cars—are available to meet a wide variety of size and weight requirements. Car tops can be fitted with gravity rolls if desired to facilitate the loading and removal of large heavy molds,—and cars with special tops, axles, wheels, etc., can be furnished to meet any requirement.

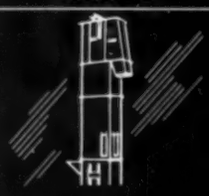
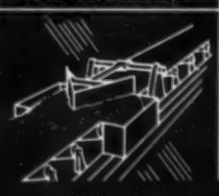
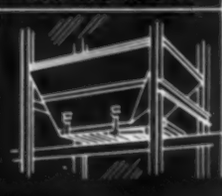
Our recently completed 40-page Foundry Bulletin No. 91 illustrates many different applications of mold conveyors and other Bartlett-Snow Foundry Equipment . . . No obligation . . . Send for a copy today!

THE C. O. BARTLETT & SNOW COMPANY
6201 Harvard Avenue **Cleveland, Ohio**
Engineering and Sales Representatives in the Principal Cities

BARTLETT-SNOW

ENGINEERS AND FABRICATORS FOR THE FOUNDRY INDUSTRY

Complete Sand, Mold and Castings Handling Equipment for any requirement, including

Shakeouts	Elevators	Aerators	Sand Distributors	Bins and Feeders	Apron Conveyors	Dust Collectors
						

Over 1000 Simpson Mixers

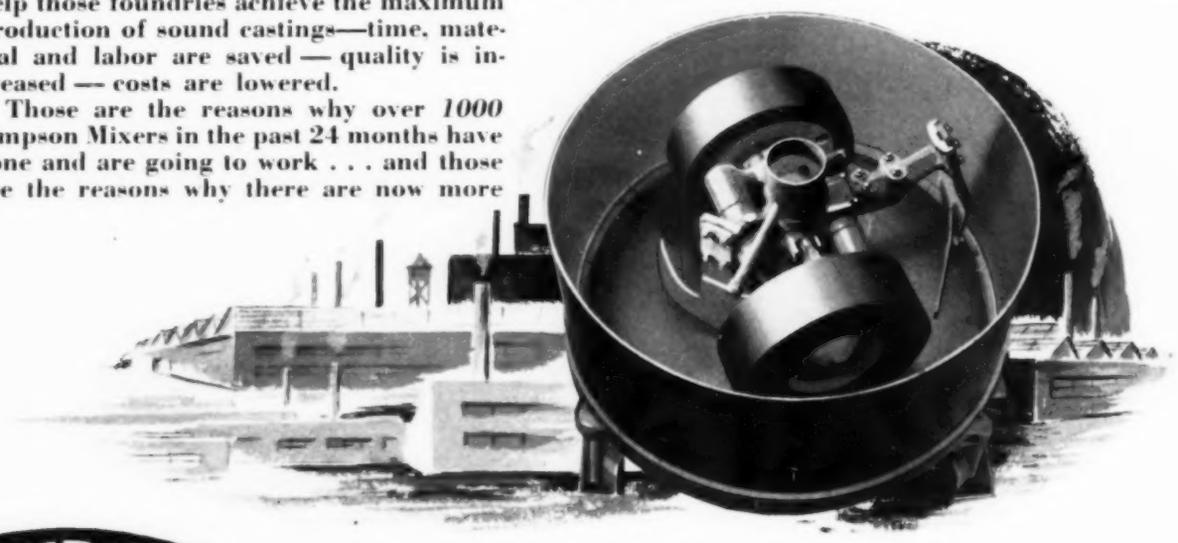
in the past 24 months...

FROM America's Foundries, large and small, ferrous and non-ferrous, flow the tremendous volume of castings needed for our tanks and planes, our bombs and guns and 1001 other products-for-war. In most of those foundries Simpson Intensive Mixers are mulling the sand to condition it properly, quickly and economically. They help those foundries achieve the maximum production of sound castings—time, material and labor are saved — quality is increased — costs are lowered.

Those are the reasons why over *1000* Simpson Mixers in the past 24 months have gone and are going to work . . . and those are the reasons why there are now more than *5000* successful installations of Simpson Mixers.

You see, there is 30 years of design and manufacturing experience behind them—and that is *your* advantage—you can capitalize on it. If you will get all the facts and check them, your answer will surely be a Simpson.

Write us, for we would like to give you all the details.



SIMPSON

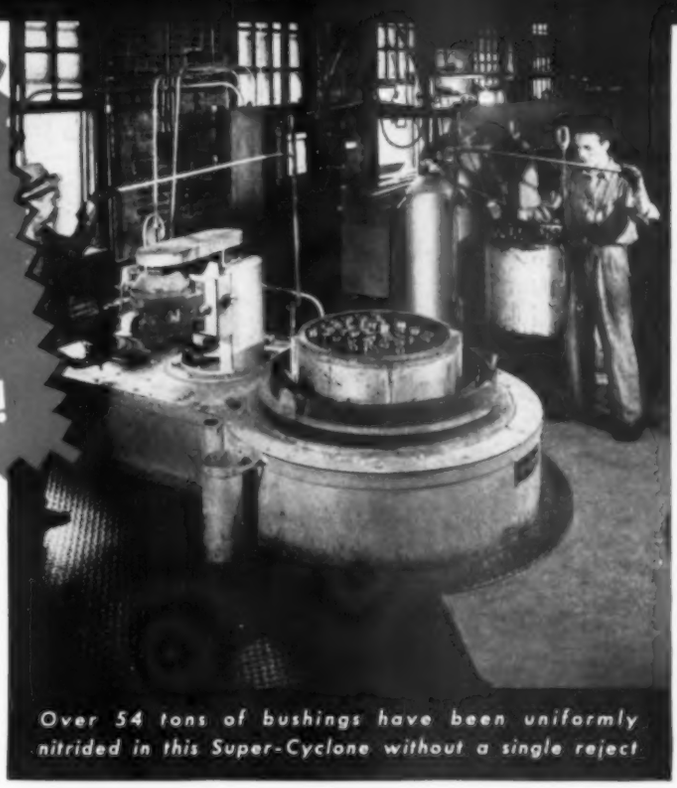
INTENSIVE MIXERS

NATIONAL ENGINEERING COMPANY

MACHINERY HALL BUILDING • • CHICAGO, ILLINOIS

Manufacturers and Selling Agents for Continental European Countries:—The George Fischer Steel & Iron Works, Schaffhausen, Switzerland. For the British Possessions, Excluding Canada and Australia—August's Limited, Halifax, England. For Canada—Dominion Engineering Co., Ltd., Montreal, Canada. For Australia and New Zealand—Gibson, Battle & Co., Pty., Ltd. Sydney, Australia

OVER 54 TONS OF BUSHINGS NITRIDED IN A LINDBERG SUPER-CYCLONE without a single reject!



Over 54 tons of bushings have been uniformly nitrided in this Super-Cyclone without a single reject

A SUPER-CYCLONE is nitriding 3450 pound loads of bushings with uniform case and hardness in a large manufacturing plant in the Middle West. The bushings are 3¼" to 4½" in length and 1¾" to 3" inside diameter, with a maximum section of ¼".

A load of 1350 of the bushings are placed in a basket and charged into the retort of the Super-Cyclone where they are uniformly heated in ammonia gas for 72 hours at approximately 980°F. The parts have a .032" to .034" case depth and are never more than .002" out of round.

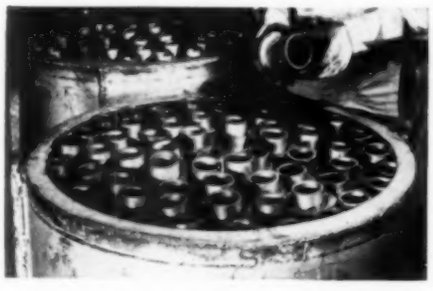
These results have been consistent since the Super-Cyclone's installation and to date over 50,000 of these bushings, more than 54 tons, have been nitrided *without a single reject!*

BUT WHY USE THE SUPER-CYCLONE?

Why not a low-temperature standard type nitriding furnace? The answer is that the same uniform job of nitriding could be handled in the Standard Cyclone Nitriding Furnace which has a top temperature of 1250°F., but this manufacturer, in obtaining the Super-Cyclone, looked further ahead than the job in hand.

In connection with the nitriding work, he can "cure" or denitride the retort by taking advantage of the high temperature range of the Super-Cyclone and, with the retort in the furnace, run the heat up to 1600°F.

A companion Super-Cyclone in the same plant is now employed for production hardening. After the nitriding job has been discontinued, he will have two 100% forced convection heated furnaces with temperatures from 250°F. to 1750°F. for hardening, annealing, normalizing, tempering, or any other heat treating operation which falls within that range.



Uniformly nitrided, this typical load of bushings has just been removed from the Super-Cyclone.

MANY ADVANTAGES

The Super-Cyclone, with its 100% forced convection heating principle and its wide temperature range, offers a variety of uses. In addition, it increases production through rapid, uniform heating of heavy loads, eliminates distortion due to uneven heating, reduces handling of material by employing a fixture to carry loads through all heating and quenching operations, and requires less floor space than conventional equipment to bring all these advantages.

Write for Bulletin 130. It gives more complete information on material handling, furnace operation, economy of floor space, sizes available and ways to figure Super-Cyclone production possibilities in your own shop.

MOVIE

Write now to reserve a date for Fall and Winter showings of the full length sound and color Heat Treating Hints movie. Loaned without charge, this film shows actual heat treating operations going on with the editors of Heat Treating Hints at their furnaces, quench tanks and straightening presses. Each operation is thoroughly explained to the satisfaction of the greenest trainee. The film is purely educational and contains no advertising.

For your coming plant or chapter activities, may we suggest that you send today for the pamphlet giving complete instructions on how to arrange for the Heat Treating Hints movie.

LINDBERG ENGINEERING COMPANY

2453 WEST HUBBARD STREET • CHICAGO

CYCLONE FOR LOW-COST ACCURATE TEMPERING

LINDBERG FURNACES

HYDRYZING FOR SCALE-FREE AND DECARB-FREE HARDENING

Get the Most Out of Every Wheel

On Your Portable Grinders

Of course the first thing is to make sure you have the right grain and grade of Norton Wheels for the types of grinding you are doing. But even when this has been done, improper handling can waste many grinding wheels.

Set the grinder down carefully each time—where it can't fall against anything. A cracked wheel may fly apart.

When you change wheels for a different size or shape don't loosen the one on the machine by banging it. Use a wrench or vise.

Keep the wheel free cutting and in balance by truing when necessary. If the speed is too slow the wheels are apt to get out of round and out of balance.

Use just enough pressure to keep the wheel cutting at its best rate and still not slow down or stall the grinder.

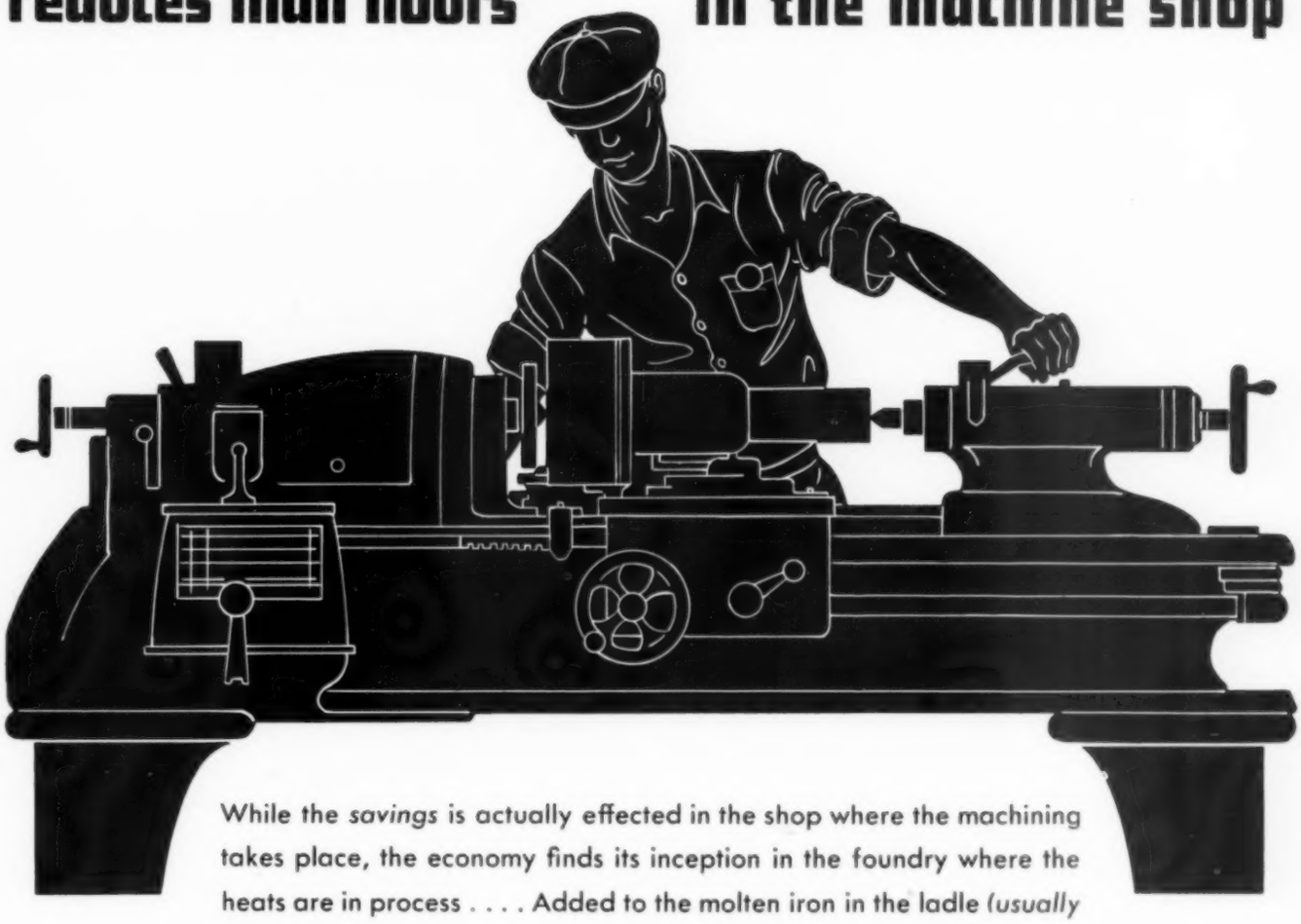
Don't hesitate to call in a Norton abrasive engineer. He'll be glad to study your grinding jobs and make sure you are using the most suitable wheels.

NORTON COMPANY, WORCESTER, MASS.

Distributors in All Principal Cities

W-886

How NO8 MEXICAN GRAPHITE reduces man hours in the machine shop



While the *savings* is actually effected in the shop where the machining takes place, the economy finds its inception in the foundry where the heats are in process . . . . Added to the molten iron in the ladle *(usually trickled into the stream of metal as it flows from the cupola spout)* No. 8 Mexican Graphite quickly reduces chill and hardness by direct positive action—producing a remarkable change in the physical characteristics of the iron. Castings thus produced enter into production bearing a definite improvement in machinability—the iron cutting more easily and quickly and the life of the tool being prolonged—a multiple savings from a single expenditure.

No. 8 Mexican Graphite is but one of the several Mexican Graphite Products available for foundry use. Bulletins are obtainable on each product listed.

MEXICAN GRAPHITE PRODUCTS

CORDIP
MEXITE BRIQUETTES
No. 8 MEXICAN GRAPHITE
MEXALOY
MEXICAN PLUMBAGO

THE UNITED STATES GRAPHITE CO.
SAGINAW, MICHIGAN, U.S.A.

TRADE MARK USG

SPEEDSLINGERS FOR TODAY'S WAR PRODUCTION

SPEEDSLINGER Doubles Production From Present Floor Space

America's war production authorities are demanding greater production from existing plants, and they are getting it from ***Speedslinger***-equipped foundries where this modern mechanism is doubling and trebling production within existing floor space. The ***Speedslinger*** will ram molds of all sizes from snaps to the largest pit molds.

SPEEDSLINGER Rams 1,000,000 Pounds of Sand In 8 Hours

Standard ***Speedslingers*** (without special equipment or accessories) will ram 1,000,000 pounds of sand every eight hours without overloading and this production may be vastly increased where necessary. It rams more secure molds than have ever been rammed before, and with less gaggers and bars. Gaggers on one mold were reduced from 118 to 15.

THE BEARDSLEY & PIPER COMPANY

JCTION AND TOMORROW'S POST WAR COMPETITION

SPEEDSLINGER Speed and Accuracy Are Unparalleled

The tremendous capacity, accuracy, uniformity and economy of S***peedslinger*** ramming would seem utterly impossible when compared with previous methods were it not being proved daily on the toughest kind of armanent work that the ***Speedslinger*** is the most productive unit ever devised for ramming molds of all shapes and sizes.

What A SPEEDSLINGER Means After The War

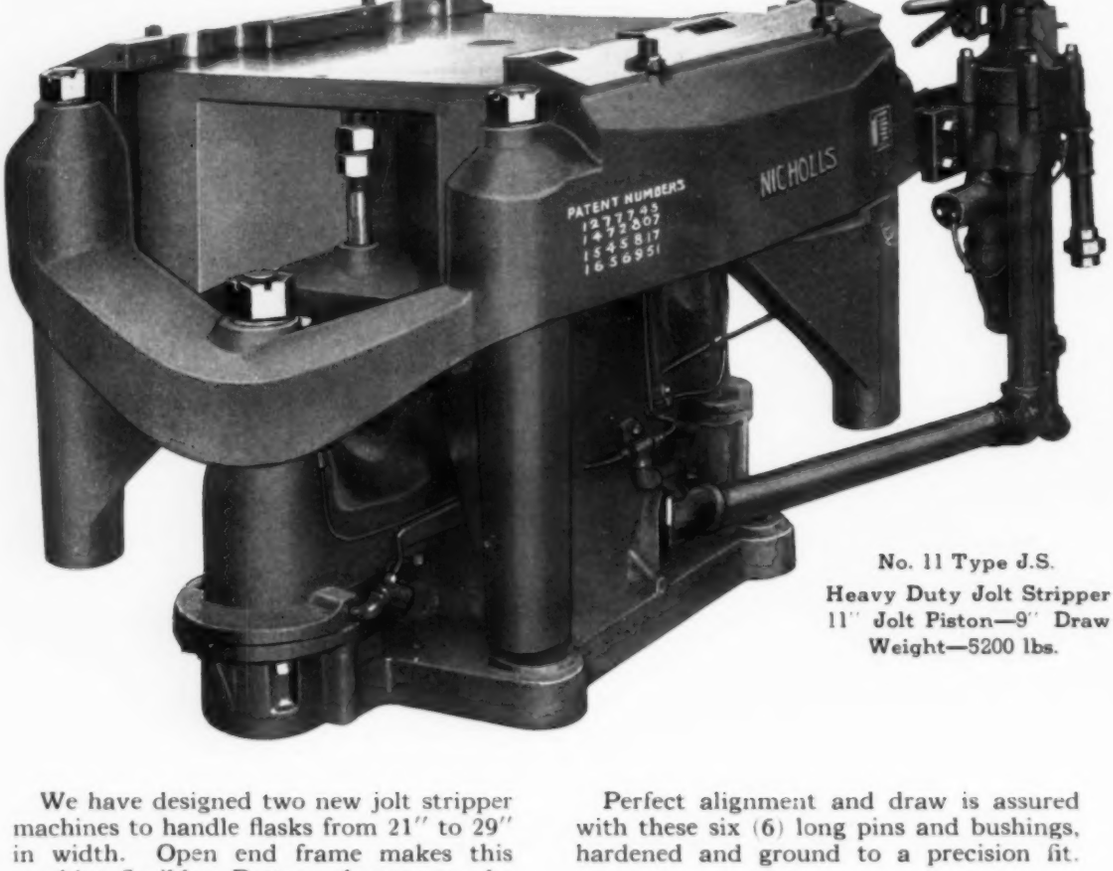
When Competition for normal markets returns; when the demand for castings that are smooth, true-to-weight and pattern changes from a wartime to a peacetime footing; when your ***Speedslinger*** could be saving you $450 during every eight hours of ramming; then you will appreciate your possession of this Better Method which rams at the lowest cost ever known.

Y 2541 North Keeler Avenue . CHICAGO

MOLDING MACHINES

designed for

QUALITY, QUANTITY AND CONSISTENCY



No. 11 Type J.S.
Heavy Duty Jolt Stripper
11" Jolt Piston—9" Draw
Weight—5200 lbs.

We have designed two new jolt stripper machines to handle flasks from 21" to 29" in width. Open end frame makes this machine flexible. Pattern changes can be made in a few minutes.

After jolting machine draws up and mold is completed. Hard jolt and fast accurate draw insures fast production and quality castings. Simple, rugged design insures consistent production and minimum maintenance.

Perfect alignment and draw is assured with these six (6) long pins and bushings, hardened and ground to a precision fit.

The principle of operation is the same as our Heavy Duty Type "D" excepting that this Jolt Stripper has no squeeze.

The principal part of this machine, the heavy base and cylinder is made of our special formula high tensile semi-steel and is cast in one (1) piece, not a number of small parts bolted together.

Wm. H. NICHOLLS Co., Inc.
RICHMOND HILL, LONG ISLAND, NEW YORK

ESTABLISHED 1910

Foreign Manufacturers and Selling Agents—

For Continental Europe and Great Britain—The George Fischer Steel and Iron Works, Schaffhausen, Switzerland

NICHOLLS

Peoria Malleable Casting Co. says —

Time Is Short!

Every minute counts in the Allies versus Axis Production Battle. Every drop, runout, and faulty casting scores a point for the enemy. Every extra minute spent in grinding down rough castings and patching up holes is a set back.

Properly conditioned sand cuts discount losses and assures smoother, sounder castings. Royers will help you win!

Nearly 4200 Royers—many times more than all other makes combined—are speeding War Production.

THE ROYER

"We're Particular About Our Sand and We Like the Way Our Royer Prepares it"!

This long established, progressive concern, now almost entirely on War Production, makes malleable iron chain, marine specialties and a wide range of automotive tractor and farm machinery parts. They purchased their first Royer four years ago and the Model "NC-2," shown above, a few months ago. "Evidence that we like their performance," says Edward Roby, plant superintendent.

"These sand separators and blenders unquestionably save time and money; but, aside from that, give us better sand and results are what we're after. We pour at 2850° F., a higher temperature than in grey iron foundries and less than is called for in steel. The machines are easily moved about to serve our seventy molders. There's no delay for the machine keeps ahead of two men shoveling. We cut every heap on the floor with our Royers. They remove core butts and recover our chills for us. We use several kinds of sand—for heavy work a more durable sand with greater permeability—higher clay content than the sand for light work, but the Royer plays no favorites—it conditions them all."

The Royer provides smooth, open, properly blended double-aerated facing, backing and core sand—natural or synthetic—for any grey iron, steel, malleable and nonferrous foundry—large or small. Ten rugged stationary and portable models—5 to 50 tons per hour. Portable models supplied with steel wheels for the duration. Two models of combination scrap removers-sand conditioners for large steel jobbing shops.

ROYER FOUNDRY & MACHINE CO. *KINGSTON, PA.*

Constant . . . Development

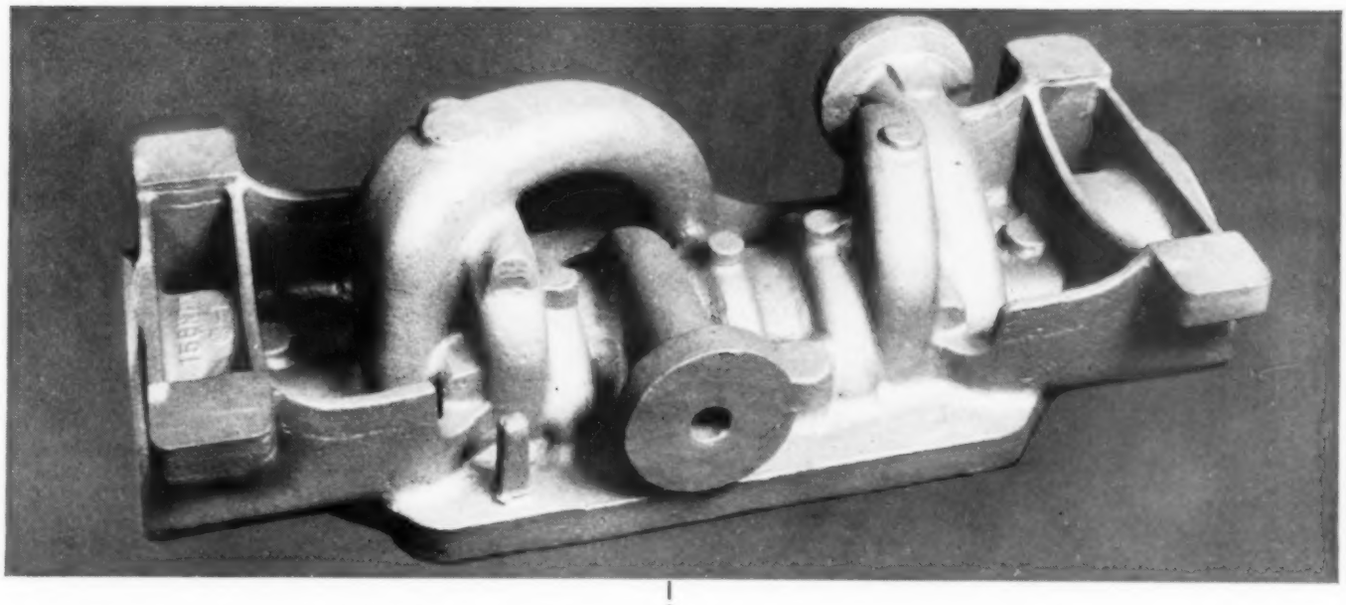
Attention to Detail
makes
FANNER
CHAPLETS
AND
CHILLS
the
Finest Procurable

• NOTE •
WE HAVE OVER
100,000,000
IN
STOCK

THE FANNER MANUFACTURING CO.

BROOKSIDE PARK • • • CLEVELAND, OHIO

CANADIAN FANNER, LTD.
HAMILTON, ONTARIO



FOUND IN THE FOUNDRY

MORE SHIPS

PLANES

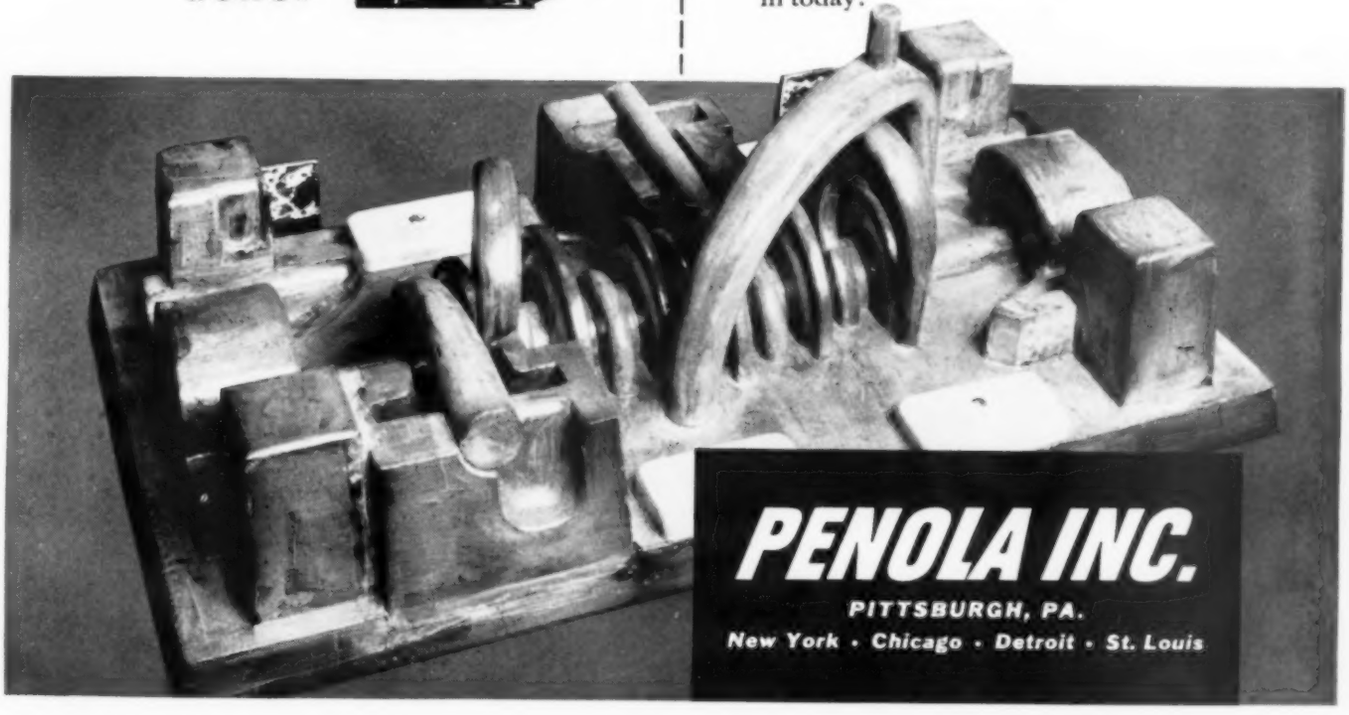
TANKS

GUNS!

Today America's foundries are delivering accurate, flawless castings for the tools of victory—more and faster than ever before!

Helping them beat these tight production schedules is Penolyn Core Oil. Its quick baking properties and fast decomposition save time. The fact that it forms less gas and holds up better during pouring results in fewer rejects.

Penola's engineers stand ready to help solve your particular problems. Call them in today!

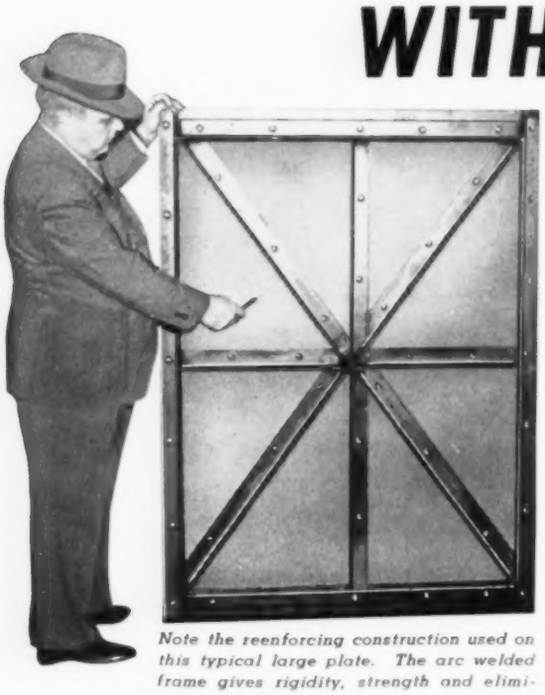


PENOLA INC.

PITTSBURGH, PA.

New York · Chicago · Detroit · St. Louis

CARRY CORES UP TO 1200 LBS. WITHOUT DEFLECTION!



Note the reenforcing construction used on this typical large plate. The arc welded frame gives rigidity, strength and eliminates deflection.

IT IS BEING DONE ON DIAMOND REENFORCED STEEL CORE PLATES

These special core plates are designed to carry large cores up to 1200 lbs., cores of any size, without deflection or warping.

You may obtain Diamond Core Plates to suit your own special requirements. They are furnished with or without perforations and in all smaller, standard sizes—plain or reenforced as indicated by your needs.

Send us detailed information on your core baking problem and we'll be glad to design a plate to handle the job. Weight of core and dimensions, in particular.

DIAMOND

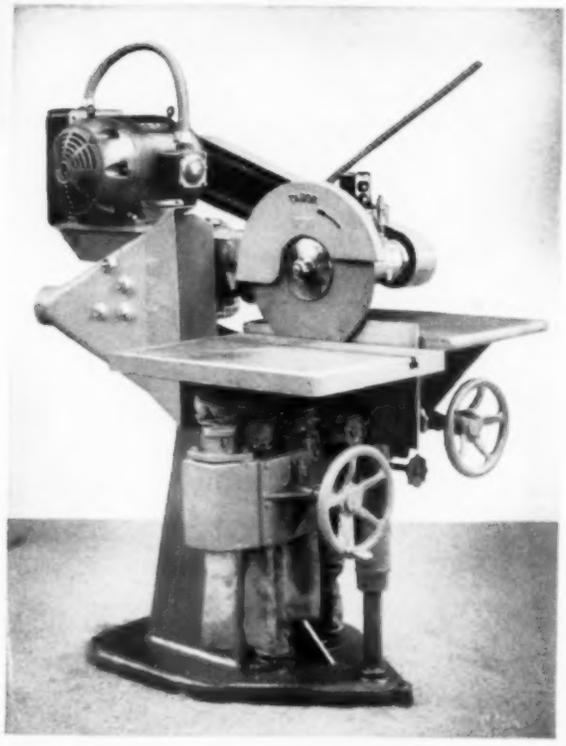
CLAMP AND FLASK COMPANY

Telephone 2553 **Richmond, Indiana**

Designers of* CORE PLATES, JACKETS, BANDS, FLASKS *since 1889

Save PRICELESS TIME *with the . . .*

TABOR-BRASIVE CUT-OFF MACHINE



The above-all need of the day is high and ever higher production. Between pouring and shipping no time can be lost . . . and none need be.

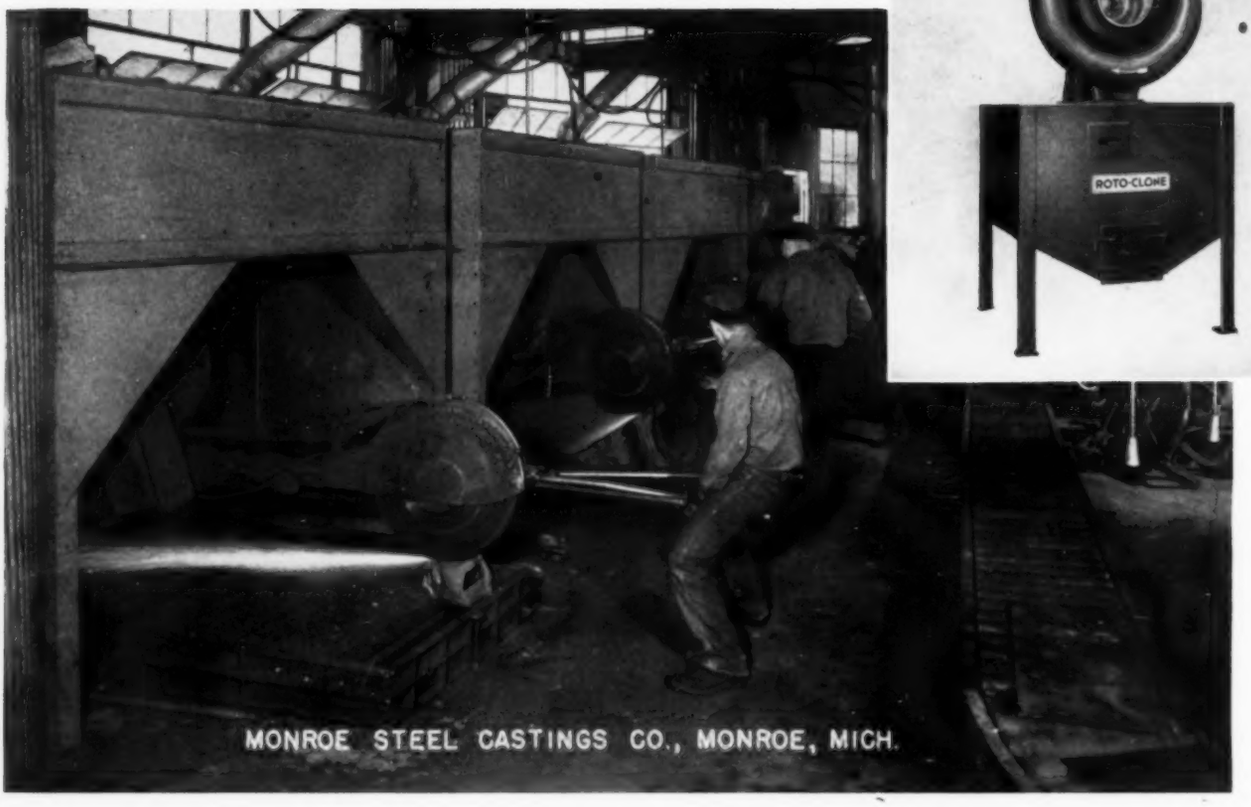
A Tabor-Brasive Cut-Off Machine will more than keep pace with your increased production schedules. It will cut gates and risers from castings of manganese bronze, aluminum bronze, nickel, monel and other tough-cutting metals in a matter of seconds—unbelievably fast. Cuts are clean and close to the casting—snagging and finishing grinding are reduced to a minimum, often entirely eliminated.

Write for information, giving details of your cutting problems. There is a Tabor-Brasive Cut-Off Machine of a size and type to meet your requirements.

THE TABOR MANUFACTURING COMPANY
6225 Tacony Street • Philadelphia • Pennsylvania

Representatives: *Los Angeles, Calif.,* Snyder Foundry and Supply Co.; *Oakland, Calif.,* Pacific Graphite Co.; *Seattle, Wash.,* Carl F. Miller & Co.

ROTO-CLONE *Dust Control* IS IDEAL FOR COLLECTING SWING-FRAME GRINDER DUST



MONROE STEEL CASTINGS CO., MONROE, MICH.

The installation shown above of a No. 24 Type D Roto-Clone for collecting dust from five swing frame grinders is typical of many similar installations. Fine dust is confined within the booths and is then exhausted by the Roto-Clone combined exhauster and dust collector preventing the dispersion of grinding dust to the work room. The Roto-Clone exhausts 12,500 c.f.m. through the five booth enclosure openings housing the swing frame grinders. The superior performance characteristics of the Roto-Clone; the minimum of space required for its installation; and savings effected in piping and power make it especially suitable to swing frame grinder dust control.

COMPLETE DUST CONTROL FOR ALL FOUNDRY OPERATIONS

SHAKE-OUT—*Without interfering with the operation, the Type W Roto-Clone successfully collects the extremely fine dust from the shake-out and is not effected by the steam and vapor contained in the exhaust air.*

SAND CONDITIONING—*The Type W Roto-Clone not only eliminates the dust nuisance but also controls permeability of the sand by removing any predetermined amount of excess fines.*

TUMBLING BARRELS—*Roto-Clone reduces tumbling time to a minimum, instantly removes the burnt sand and prevents settling of the heavy dust by maintaining uniform velocity within the pipes at all times.*

CASTING CLEANING—*Due to the abrasive nature of the dust created by casting cleaning and the exceedingly heavy and fluctuating dust load, Roto-Clone is especially suitable to this application.*

ABRASIVE CLEANING—*The Type W Roto-Clone offers the advantages of high efficiency, low power consumption, and convenient disposal of the collected material as sludge without creating a secondary dust problem.*

AMERICAN AAF AIR FILTERS

AMERICAN AIR FILTER COMPANY, INC., 266 CENTRAL AVE, LOUISVILLE, KY.
INCORPORATED

IN CANADA, DARLING BROTHERS, LIMITED, MONTREAL, P. Q.

Ferro-Alloys
indispensable in the manufacture of steel.....major elements in our war program..... conserve them!

Ohio Ferro-Alloys Corporation
Canton, Ohio
CHICAGO DETROIT PITTSBURGH TACOMA

Increase Production with
ROTOPLANE Speed Sifters

"Hard-to-Please" Foundries Standardize on Rotoplane!

ORDER FROM YOUR FOUNDRY SUPPLY HOUSE

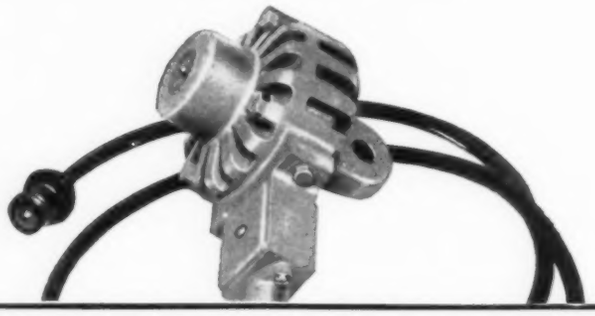
Try ROTOPLANE in your plant. You, too, will find it increases production, does *all* your sifting more quickly and economically. One size and type for all sifting jobs.

ROTOPLANE is built for long, dependable service. Strong, one-piece frame gives remarkably effective vibration. Smooth, free, rotary action. All mechanism completely enclosed and dustproof. Weight approx. 90 lbs., 62 in. high overall.

Steel-mounted sieves instantly interchangeable. No jagged screen edges, no storage problem. 20 in. diameter clear sifting area.

TEN DAYS FREE TRIAL.

$175.00 f.o.b. Chicago—complete with cable, safety ground wire, one sieve (2-4 mesh). Standard ½ h.p. motor, 115-230 volts 60 cycle single phase.
Prices with other motors quoted on request.



ELECTRIC VIBRATORS

True-to-pattern castings make satisfied customers . . . more repeat business. Increase your production and castings quality with RED Electric Vibrators. Sturdy, dustproof, lowest operating cost (electricity does not freeze). Unequaled for consistent year-'round results in foundries all over the world.

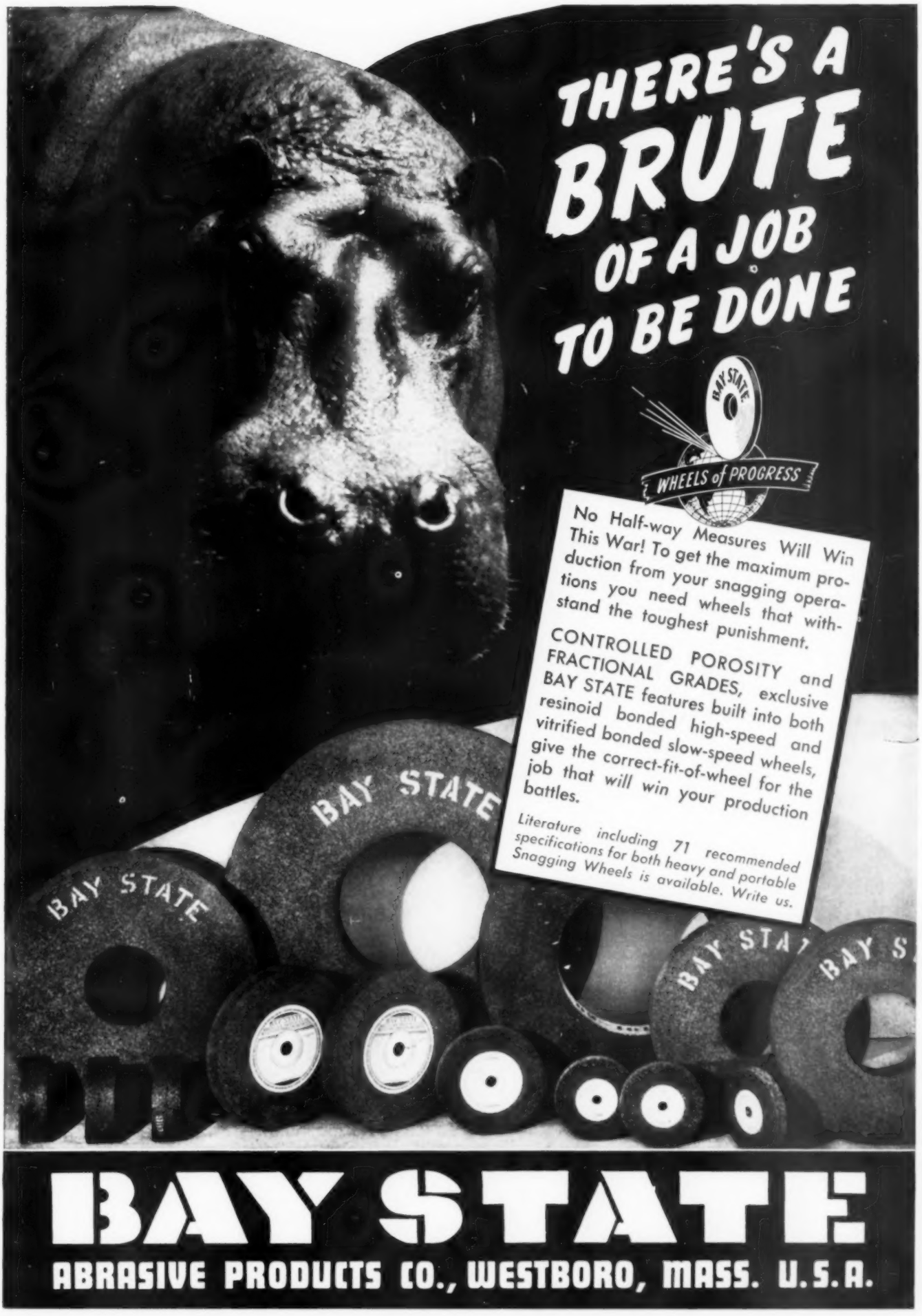
(All Prices f.o.b. Chicago)

No. 1—Light match plate work	$10.00	No. 5—Heavy match plate, tub, bench	$17.00
No. 2—Medium match plate	13.00	No. 9—Machine and heavier	24.00

FOUNDRY SUPPLIES MANUFACTURING CO.

2221 Orchard Street — Chicago, Illinois

CABLE ADDRESS: "ROTOPLANE CHICAGO"


THERE'S A BRUTE OF A JOB TO BE DONE
BAY STATE
WHEELS of PROGRESS
No Half-way Measures Will Win This War! To get the maximum production from your snagging operations you need wheels that withstand the toughest punishment.
CONTROLLED POROSITY and FRACTIONAL GRADES, exclusive BAY STATE features built into both resinoid bonded high-speed and vitrified bonded slow-speed wheels, give the correct-fit-of-wheel for the job that will win your production battles.
Literature including 71 recommended specifications for both heavy and portable Snagging Wheels is available. Write us.
BAY STATE
BAY STATE
BAY STATE
BAY STATE
BAY STATE
ABRASIVE PRODUCTS CO., WESTBORO, MASS. U.S.A.

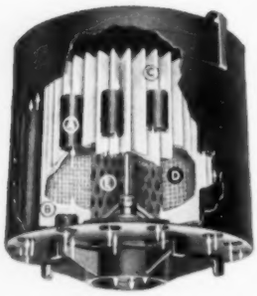
STAYNEW FILTERS

What Does the Name "STAYNEW" Mean? » » » » » » » »

1. Less Wear on Engines and Compressors
2. More Service from Air-Powered Tools
3. Longer Lasting Filters

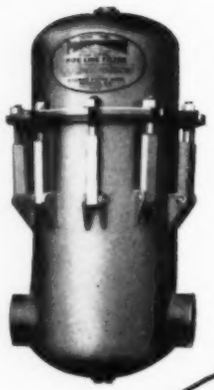
ENGINE AND EQUIPMENT-SAVING FILTERS FOR INDUSTRY

FOR ENGINE & COMPRESSOR PROTECTION



Models D, DS: Permit only clean, dust-free air to be drawn into engine and compressor intake. Model DS features rectifying tubes of scientific diameter to length ratio that "quiets the thump that hurts your ears." Feltex Filtering Medium in Radial Fin Construction provides greatest possible filtering area and efficiency with permanently low restriction to air flow. D and DS Protectomotors make new engines and compressors stay new—add to life and efficiency of old ones.

FOR LIQUID LINES (Including Water)



Models CPHL, CPHLS: Famous Radial Fin Construction applied to the filtration of liquids. Fuel and lubricating oil models remove abrasive matter from oil lines for engines and compressors, preventing excessive wear of all parts lubricated by crankcase oil system; prevent, also, clogging and wear of fuel nozzles. All parts stay new longer. Swing-bolted head if required.

NEW WATER FILTER: An outstanding success everywhere. Used in scores of applications where pure filtered water is a necessity.

FOR COMPRESSED AIR & GAS LINES

Models CP, CPH: Hundreds of thousands in use throughout industry. Guaranteed delivery of clean, dry air, free from dust, dirt, pipe-scale, rust, water. All air-powered tools operate more efficiently, last longer when air supply is kept clean with Protectomotor Pipe Line Filters. Protectomotors often save their cost in a few months. Like all Staynew and Protectomotor filters—easy to inspect, easy to clean, low restriction to air flow, long lasting. Models for horizontal and vertical installation.

Representatives in Principal Cities

Get the Entire Story!

Find out about Staynew and Protectomotor engine and equipment-saving features: Radial Fin Construction—Feltex and Glastex Filtering Mediums—*Double* Counter-clockwise Rotating Curtains—Fire-resistant Wire Kladding, etc., etc.

Catalog describes entire line, including filters for building ventilation.

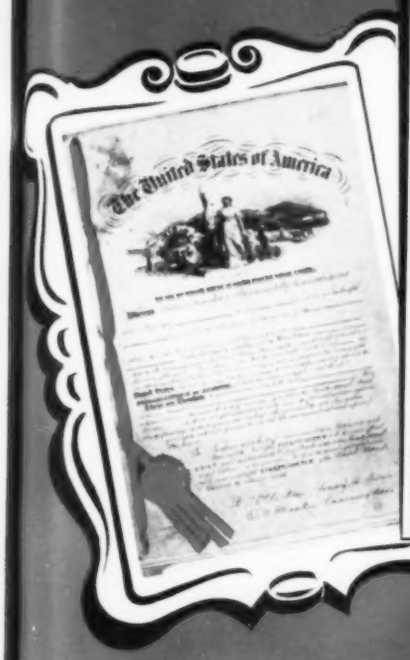
WRITE FOR COMPLETE CATALOG

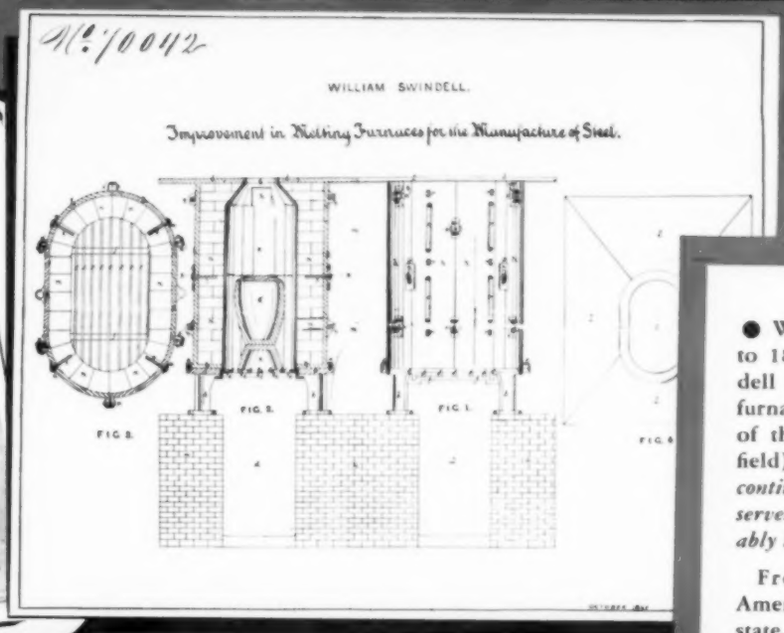
PROTECTOMOTOR AIR FILTERS

STAYNEW FILTER CORP.

36 Centre Park, Rochester, N. Y. *"Filter Headquarters"*

Over 90 YEARS OF KNOWING HOW





● We look back for a moment to 1850, when William Swindell designed his first steel-furnace (later to receive one of the earliest patents in the field), *only to emphasize the continuity of experience which serves our customers so invaluably today.*

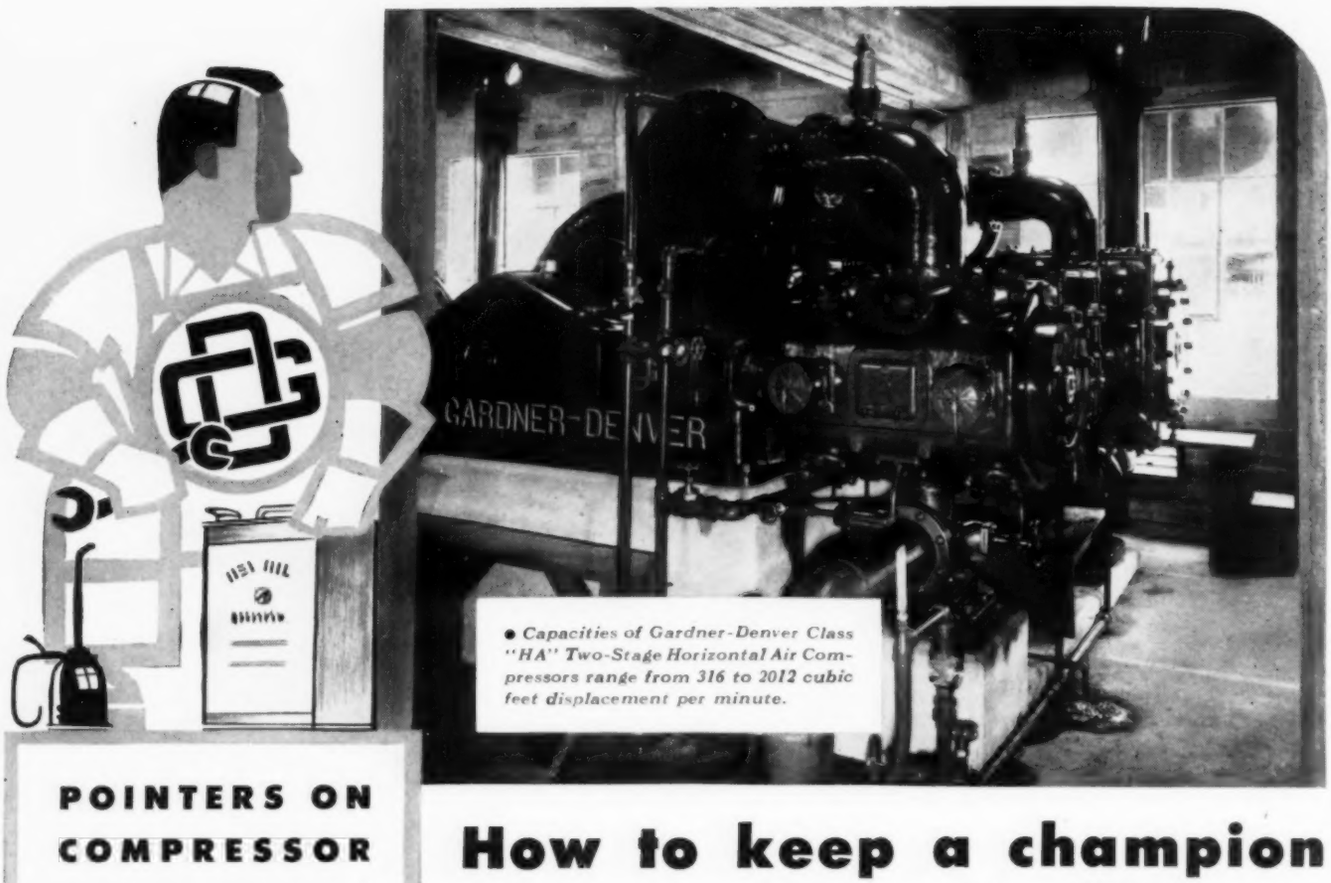
From Steel's infancy in America to its present adult state, Swindell Furnaces have maintained their leadership . . . a fact doubly proved by unprecedented current performance in the nation's service!

SWINDELL ELECTRIC MELTING FURNACES

SWINDELL-DRESSLER *Corporation*

DESIGNERS AND BUILDERS OF MODERN INDUSTRIAL FURNACES

PITTSBURGH, PA.



• *Capacities of Gardner-Denver Class "HA" Two-Stage Horizontal Air Compressors range from 316 to 2012 cubic feet displacement per minute.*

POINTERS ON COMPRESSOR MAINTENANCE

★

Keep crankcase oil reservoir filled to proper level with high grade engine oil. Change oil every two to four months, depending on service.

★

Use only best grade of air compressor oil for lubricating compressor cylinders—and don't use too much oil in the cylinders.

★

Clean intake air filter at least once a week.

★

Test safety valves daily to prevent sticking.

★

Clean air line water traps frequently.

How to keep a champion performer at peak efficiency

Determinedly—without pause—foundries are shouldering today the biggest job in their history. To stand the strain of grueling schedules, every piece of foundry equipment must be able to deliver champion performance.

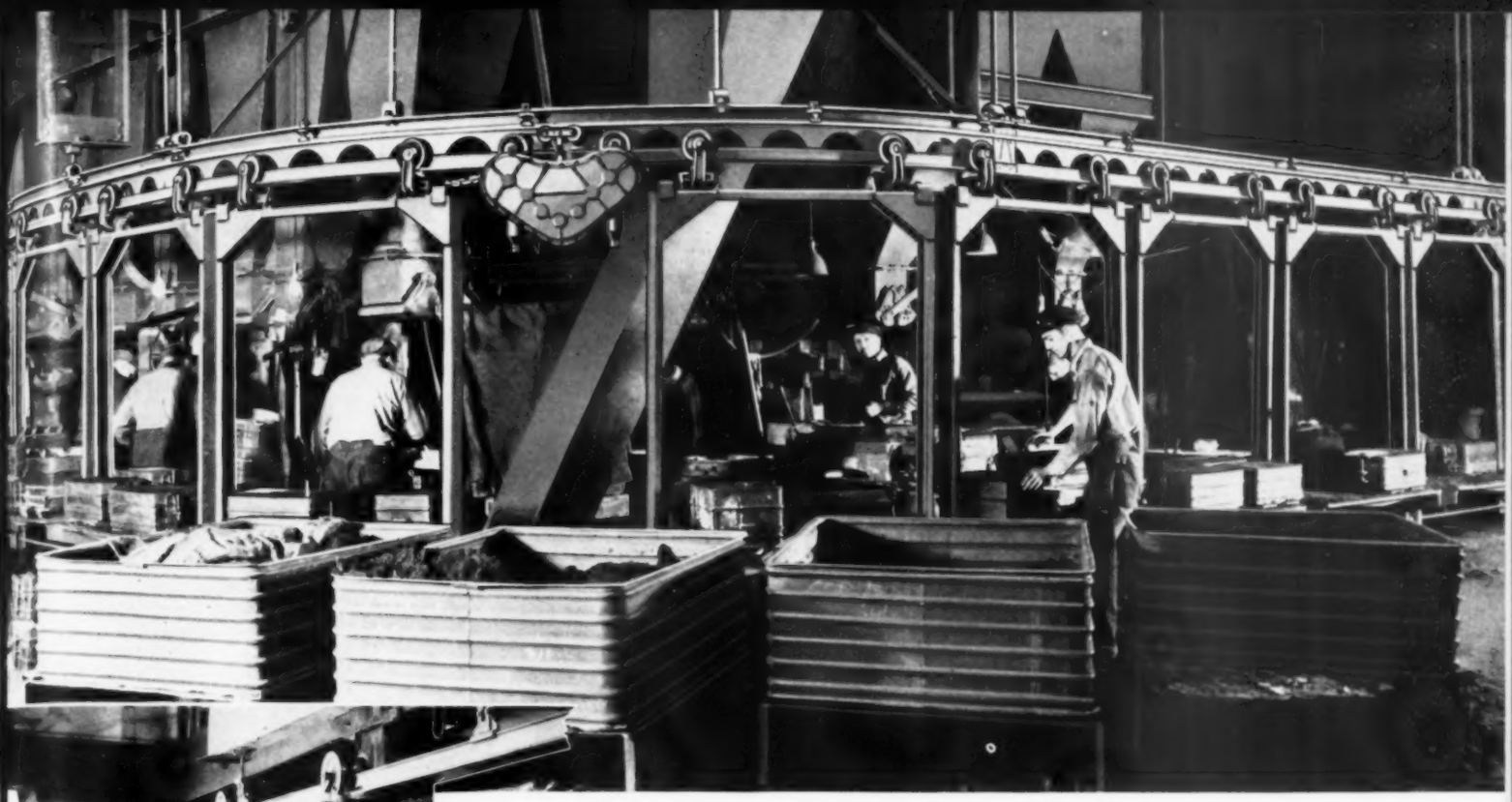
Gardner-Denver "HA" Two-Stage Horizontal Compressors are famous for such performance. Their dependability in heavy-duty, continuous performance—their unusually low horsepower requirements—and their ability to establish remarkable maintenance records—these are some of the "extras" that make these compressors champion performers throughout industry.

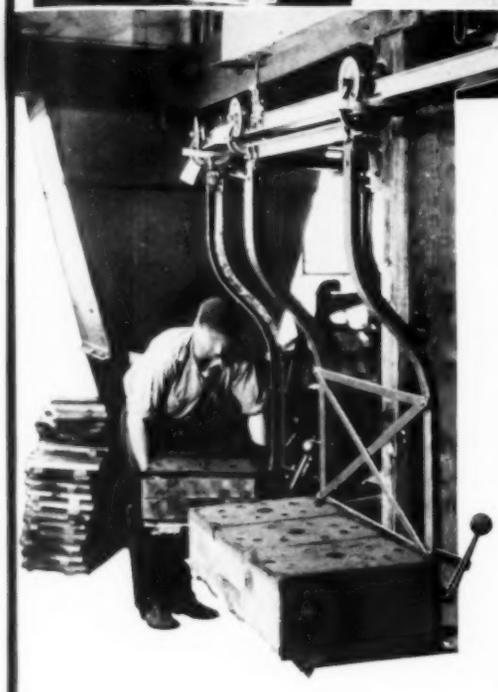
For full information, write Gardner-Denver Company, Quincy, Illinois.

• *Gardner-Denver Class "RX" Single-Stage Horizontal Air Compressor—a ruggedly built machine with remarkably low horsepower requirements. Capacities from 89 to 1292 cubic feet per minute.*

GARDNER-DENVER PRODUCTS HELP SPEED ICTORY

GARDNER-DENVER *Since 1859*





CLEVELAND TRAMRAIL . . .
Continuous Foundry System
SPEEDS PRODUCTION — REDUCES EMPLOYEE FATIGUE — SAVES TIME — CUTS COSTS

From 50% to 75% of the usual handling of materials is eliminated with a Cleveland Tramrail Continuous Foundry System. The various foundry operations are so arranged that rack carriers travel on overhead rail from one operation to the other in logical order, and when the entire circuit has been traversed one or a number of castings have been completed.

Thus the carriers travel from the molding section to core-setting, to pouring, to cooling and to shake-out, eliminating the need of carrying sand, flasks, molds, molten metal, castings, etc., to and from the usual pouring floor. After the carriers leave the shake-out area they continue to the molders and the cycle is repeated.

The elimination of so much handling saves time, speeds production and cuts costs. Employee fatigue is reduced greatly because of the reduction of handling and stooping, since the racks are built to the most convenient working height. Far less floor space is needed as the molds are kept moving and poured within a few minutes. Temperature loss of metal is extremely low because the metal is poured nearly as soon as it leaves the cupola.

Top photo illustrates an electrically-driven high-production system for large foundries. Illustration at left shows a simple hand-propelled system for small foundries. Cleveland Tramrail Continuous Foundry Systems have proven advantageous to foundries of all sizes.

BOOKLET No. 2008 . . Packed with valuable information. Profusely illustrated. Write for free copy on your company letterhead.

GET THIS BOOK!

CLEVELAND TRAMRAIL DIVISION
THE CLEVELAND CRANE & ENGINEERING CO.
1155 EAST 283RD ST. WICKLIFFE, OHIO.

MANUFACTURERS OF • CLEVELAND CRANES • CLEVELAND TRAMRAIL • STEELWELD BENDING PRESSES

CLEVELAND TRAMRAIL

OVERHEAD MATERIALS HANDLING EQUIPMENT

Let's get TOUGH about it!

with FASTER CUTTING, MORE RUGGED Buffalo Grinding Wheels

Don't keep Hitler waiting. America is counting on steel foundries to put armor and other vital castings on the front lines . . . THE QUICKEST AND BEST WAY.

Only fast cutting and rugged grinding wheels should be used for snagging operations.

Electro Refractories and Alloys Corp. has responded to this urgent need with the *Buffalo* Grinding Wheel - - - specifically designed for steel foundry war requirements. *This wheel will produce at a high rate without costly sacrifice of durability.*

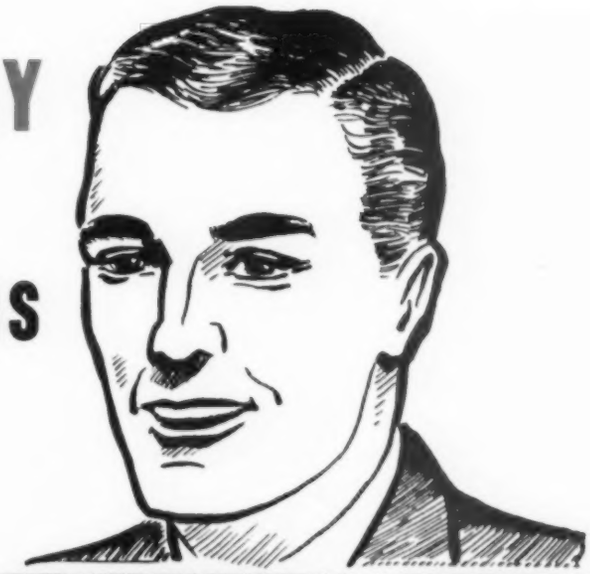
Your inquiry will receive immediate attention. Deliveries for war purposes will be made promptly.

ELECTRO REFRACTORIES AND ALLOYS CORP.

GENERAL OFFICES: ANDREWS BUILDING, BUFFALO, N. Y.

Manufacturers of Crucibles, Alloys, Stoppers, Refractories, Grinding Wheels

HERE'S THE WAY
TO PRODUCE
VICTORY CASTINGS
FASTER!



Hundreds of foundries, even before the war, had proved that Clearfield Sand Mixers were improving their production by delivering uniformly prepared mold, facing and core sands at a dependably fast rate . . . molds were more satisfactory . . . rejects were less.

Now that Victory depends so greatly on speed, foundrymen more than ever look to Clearfield Sand Mixers for rapid sand preparation and reconditioning . . . consistently uniform batches and for broad adaptability of purpose.

These advantages, which have always been outstanding features of the Clearfield Sand Mixer, are of prime importance today . . . when Victory is your stake.

CLEARFIELD SAND MIXERS

CLEARFIELD
MACHINE COMPANY

CLEARFIELD
PENNSYLVANIA, U. S. A.

Mr. Foundryman-

Do you have sand problems? *Only* ECP gives you *free* the experience of SEVEN full-time service engineers. Their average background is 13 years. They make 10,000 calls a year. They offer you FIVE different bonding clays and many combinations to do your job *right*. No obligation.

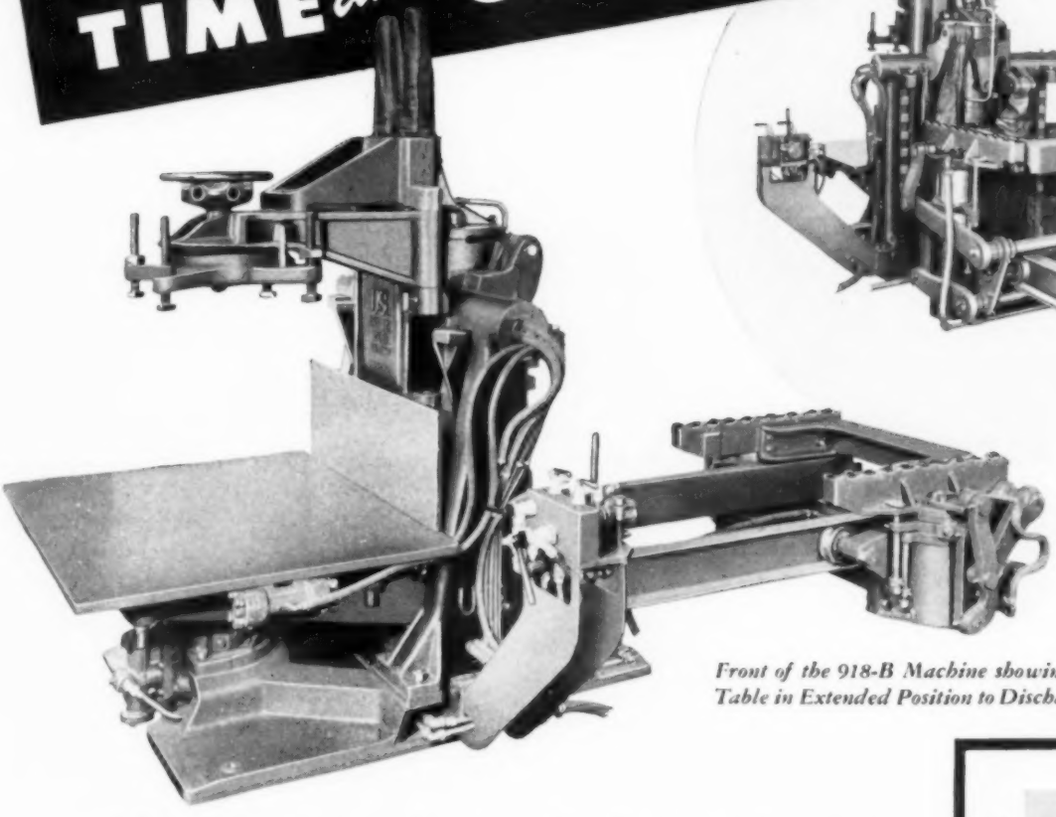
EASTERN CLAY PRODUCTS, INC.
EIFORT, OHIO

DIXIE BOND · BLACK HILLS BENTONITE · REVIVO BOND · REVIVO SUPER BOND · BALANCED REVIVO

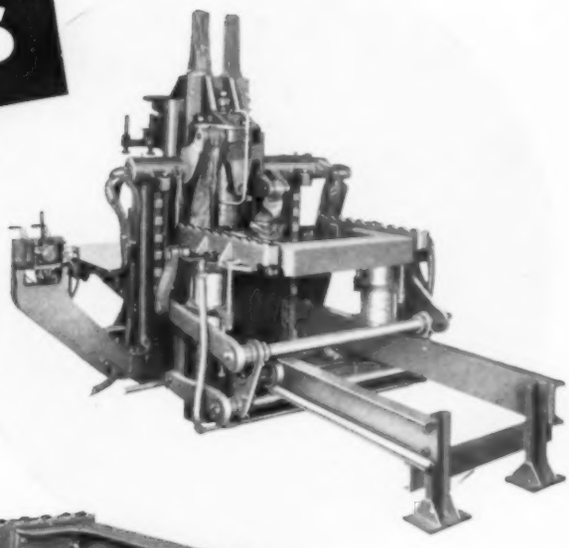
ECP *All* TYPES OF BONDING CLAYS

A Foundry Sand Service Based Upon Practical Research

CUT MOLDING TIME and COSTS



Front of the 918-B Machine showing the Roll-out Table in Extended Position to Discharge the Mold.



Back of the 918-B Machine showing the Roll-out Table in Raised Position to Receive the Mold.

with Johnston & Jennings New No. 918-B Jolt Roll-Over Pattern Draw Machine

• This machine requires no pit and is of open end construction. It has a shockless jolt, free from rebound, and a perfect draw. An air operated clamp in the center of the table adjusts itself automatically for various height flasks and the automatic adjustable roll-out conveyor delivers the completed mold at the required height assuring accurate, uniform and speedy molding. This machine has a 44″ x 54″ table—20″ pattern draw and 2000 lb. capacity. Write today for descriptive catalog giving full information of this and other Johnston & Jennings molding machines.

THE JOHNSTON & JENNINGS COMPANY

867 ADDISON ROAD • CLEVELAND, OHIO

A COMPLETE LINE PROVEN IN SERVICE INCLUDING—

PLAIN AIR JOLTS
in 12 different sizes

JOLT SQUEEZERS
fast sturdy machines—3 sizes

JOLT STRIPPING PLATES
4 sizes ranging up to 16″ draw

JOLT, SQUEEZE, STRIPPING PLATE AND PATTERN DRAWS
Popular for medium service —2 sizes

PORTABLE JOLT ROLL-OVER AND PATTERN DRAW
A heavy duty thoroughly dependable machine—portable

JOLT ROLL-OVER AND PATTERN DRAWS
Fast large capacity machines with roll-out conveyors—4 sizes

Write for fully descriptive catalog giving complete specifications.

CLEAN CASTINGS
INCREASE PRODUCTION

TAM FOUNDRY ZIRCONITE SAND YIELDS SMOOTH CASTINGS AND REDUCES CLEANING TIME

TAM Foundry Zirconite Sand used for the entire mold or as a facing sand resists the burning in of the metal and makes possible the production of clean castings and the expansion of output by reducing time in the cleaning department.

TAM Foundry Zirconite Sand does not warp, requires minimum venting and the faster chilling permits better metal distribution into heavy sections and reduces "hot tears"! Four important factors.

TAM Foundry Zirconite Sand is available in three grades, Zirconite Sand A has an approximate melting point of 3812° F. Zirconite Sands B and C 3650° F.

Full particulars on the proper applications of Foundry Zirconite Sands will be sent immediately upon request. Write:

TITANIUM
ALLOY MANUFACTURING COMPANY

TAM Foundry Zirconite Sand "A" was used in the core for the chrome steel impeller wheel illustrated. Note the clean, smooth surfaces.

GENERAL OFFICES AND WORKS: NIAGARA FALLS, N. Y., U. S. A.
EXECUTIVE OFFICES: 111 BROADWAY, NEW YORK CITY

Representatives for the Pacific Coast . . . BALFOUR, GUTHRIE & CO., San Francisco, Los Angeles, Portland, Seattle, Tacoma
Representatives for Canada . RAILWAY & POWER ENG. CORP., Ltd., Toronto, Montreal, Hamilton, Winnipeg, Vancouver, Sydney
Representatives for Europe . . . . . T. ROWLANDS & CO., Ltd., 23-27 Broomhall St., Sheffield, England

TANKS TORPEDOES TOMMY GUNS

Whatever You Are Building, a Keleket X-Ray Inspection Unit Will Meet Your Requirements!

KELEKET industrial X-ray units afford a full range of **radiographic inspection,** from the lightest gauge aluminum sheet to heavy armor plate, of **microradiography** for investigating alloy compositions, and of **diffraction analysis** for research in crystalline structures.

KELEKET radiographic inspection equipment will pay for itself many times over by revealing hidden flaws in materials before expensive machining, thus preventing failures and rejects, with a consequent saving of money and man hours.

If you have an inspection problem, you are invited to consult with the KELEKET industrial X-ray engineers.

KELEKET X-RAY

INDUSTRIAL EQUIPMENT

THE KELLEY-KOETT MFG. CO., *Industrial Division*
227-9 West Fourth Street, Covington, Kentucky
Representatives in 64 Cities

PIONEER CREATORS OF *QUALITY* X-RAY EQUIPMENT SINCE 1900

TO EXECUTIVES:

NOW YOU CAN HELP

Even More...

New Treasury Ruling Permits Purchases UP TO $100,000, in any Calendar Year, of Series F and G WAR BONDS!

The Treasury's decision to increase the limitations on the F and G Bonds resulted from numerous requests by purchasers who asked the opportunity to put more money into the war program.

This is not a new Bond issue and not a new series of War Bonds. Thousands of individuals, corporations, labor unions, and other organizations have this year already purchased $50,000 of Series F and G Bonds, the old limit. Under the new regulations, however, these Bond holders will be permitted to make additional purchases of $50,000 in the remaining months of the year. The new limitation on holdings of $100,000 in any one calendar year in either Series F or G, or in both series combined, is on the cost price, not on the maturity value.

Series F and G Bonds are intended primarily for larger investors and may be registered in the names of fiduciaries, corporations, labor unions and other groups, as well as in the names of individuals.

The Series F Bond is a 12-year appreciation Bond, issued on a discount basis at 74 percent of maturity value. If held to maturity, 12 years from the date of issue, the Bond draws interest equivalent to 2.53 percent a year; computed on the purchase price, compounded semiannually.

The Series G Bond is a 12-year current income Bond issued at par, and draws interest of 2.5 percent a year, paid semiannually by Treasury check.

Don't delay—your "fighting dollars" are needed *now*. Your bank or post office has full details.

Save With . . .

War Savings Bonds

This space is a contribution to America's All-Out War Program by THE FOUNDRY

SAFETY GRINDING WHEELS

AND SWING FRAME GRINDERS MAKE GOOD TEAMMATES FOR FASTER, SAFER SNAGGING

SAFETY GRINDING WHEELS and SAFETY DE LUXE SWING FRAME GRINDERS are teaming together in war factories, foundries and shops all over the country, speeding up production, doing a faster, safer job of snagging. For example: We helped one of the nation's largest manufacturers of airplane propellers increase production and simplify operations by means of the SAFETY Swing Frame Grinder. Let a SAFETY Sales Engineer — a man experienced in grinding production problems—show you how SAFETY Grinding Wheels teamed with SAFETY Swing Frame Grinders or SAFETY Floor Stand grinding equipment can help you speed up your production. There's no obligation. We can assure prompt delivery on wheels and equipment.

FOR PROMPT DELIVERY AND ADVICE ON YOUR GRINDING PROBLEMS, PHONE THE NEAREST "SAFETY" SALES OFFICE LISTED BELOW, OR WRITE TO THE FACTORY DIRECT.

THE SAFETY GRINDING WHEEL & MACHINE CO.

Main Office and Factory SPRINGFIELD, OHIO, Phone 4651

● SALES OFFICE ★ SALES OFFICE and WAREHOUSE

● Birmingham—3-3323 ★ Chicago—BRUnswick 2000 ★ Cleveland—CEdar 9292 ★ Detroit—TOwnsend 8-4740
★ Pittsburgh—COurt 2822 ★ Erie—25-687 ★ Philadelphia—WAlnut 3132 ★ St. Louis—CEntral 3787
★ Syracuse—2-2191 ● Milwaukee—BLuemound 0742

DO IT FAST - DO IT RIGHT

WITH SPO *Molding Machines*

THE SPO No. 506 MOLDING MACHINE

A molding machine? Yes . . . But you get much more when you ask SPO to study your situation. You cash in on our many years' practical foundry experience — which puts the *one right production unit* on your floor.

Do you need equipment with a hard, powerful jolt capable of continuous, gruelling service? with an exceptionally smooth rock-over which requires no juggling of valves? Do your patterns have a minimum of draft that calls for very accurate draw? The SPO No. 506 Jolt Rock-over Pattern Draw Molding Machine is especially suited to all work of this kind.

It is operated entirely by air. Air clamp and levelling device are controlled by one valve to insure safety. The rock-over table is held rigidly in both jolting and pattern draw positions. The No. 506 is adaptable equally to steel, iron and non-ferrous operation; particularly to foundries where medium orders necessitate the changing of patterns several times daily.

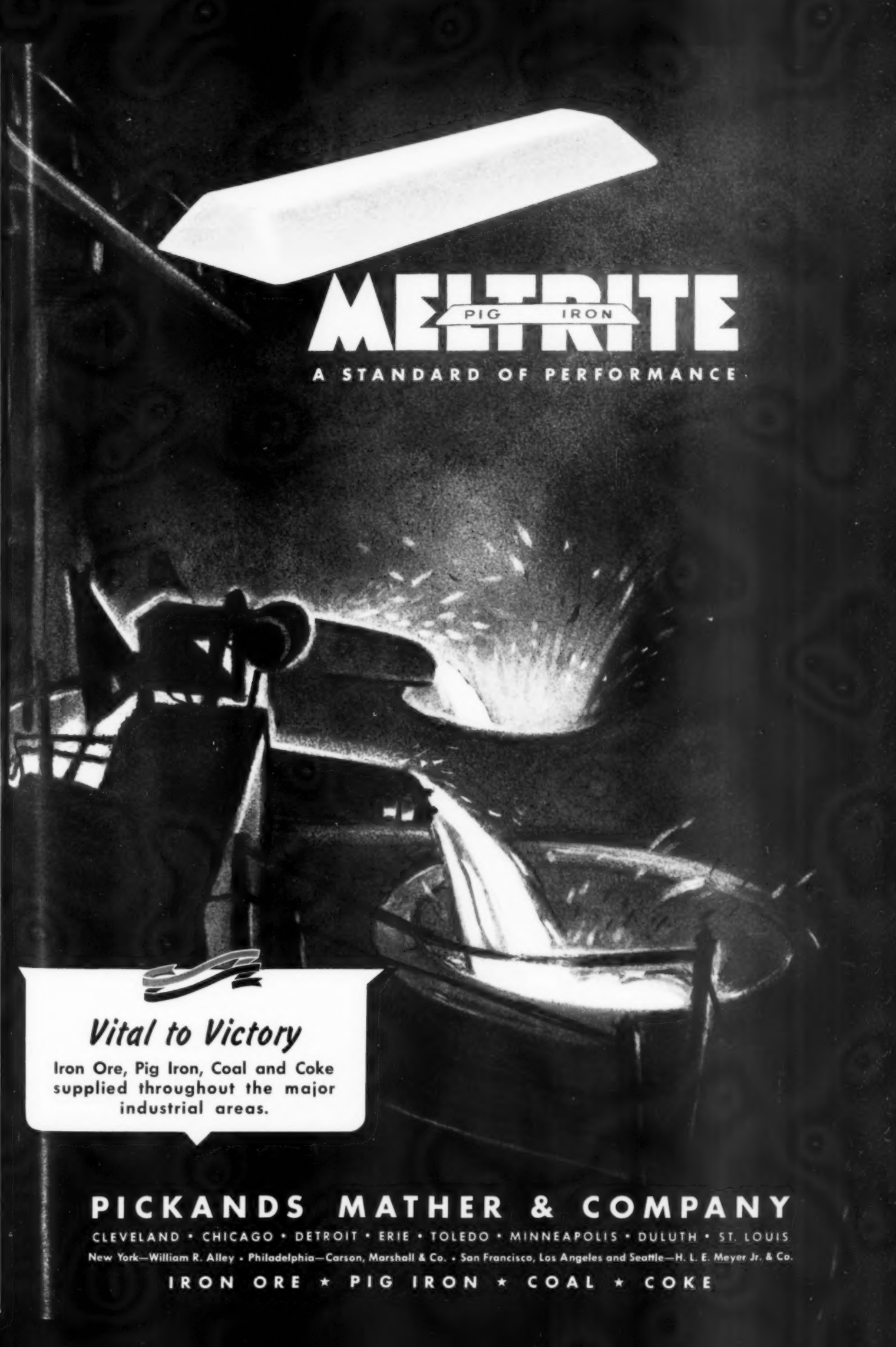
Why not let the SPO engineering staff sit in with you on your next job? You can rely upon their counsel to recommend the *right equipment for your purpose.*

SPO

INCORPORATED

Manufacturers and Specialists in Molding Machines, Vibrators and Patterns for Production

7500 GRAND DIVISION AVENUE • • CLEVELAND, OHIO


MELTRITE
PIG IRON
A STANDARD OF PERFORMANCE
Vital to Victory
Iron Ore, Pig Iron, Coal and Coke supplied throughout the major industrial areas.
PICKANDS MATHER & COMPANY
CLEVELAND • CHICAGO • DETROIT • ERIE • TOLEDO • MINNEAPOLIS • DULUTH • ST. LOUIS
New York—William R. Alley • Philadelphia—Carson, Marshall & Co. • San Francisco, Los Angeles and Seattle—H. L. E. Meyer Jr. & Co.
IRON ORE ★ PIG IRON ★ COAL ★ COKE

To plant supts. This is one of a series of ads addressed primarily to new grinder hands. If you would like additional copies without our signature, for your bulletin board, tell us how many you need.

HOW TO GET BETTER AND LONGER SERVICE FROM GRINDING WHEELS

• Speeding production is only part of a grinder hand's wartime job. Basic materials must be conserved at the same time. With grinding playing so important a part in production, these simple rules may help you do both parts of your job better.

1 MAKE SURE THE GRINDING WHEEL IS CORRECTLY MOUNTED

To get the best service from grinding wheels, you must start with the right wheel and the correct set-up. Next it is important to make certain the wheel is properly balanced and correctly mounted. This must be done painstakingly to make sure it is in perfect balance and runs true without vibration or wobble. Where operators have difficulty doing this, they should ask their supervisors for instructions on proper balancing, truing and mounting procedure.

2 MAKE SURE THE GRINDING MACHINE IS IN GOOD CONDITION

The right wheel, the correct set-up and proper mounting are still not enough to insure long wheel life if the grinding machine itself is not in good condition. Bearings should be snug, foundations firm and every care taken to keep the machine as free from vibration as possible. The inspections and servicing necessary to maintain a grinding machine in tiptop condition will be paid for many times in longer wheel life, better work and higher production.

THE CARBORUNDUM COMPANY • **NIAGARA FALLS, N. Y.**

REG. U. S. PAT. OFF.

(Carborundum is a registered trade-mark of and indicates manufacture by The Carborundum Company)

In the War of Production DELTA research laboratories play a vitally important part. In addition to scientifically developed, laboratory controlled products for modern, high-speed foundry production a great number of other DELTA developments are used, either directly or indirectly, by all branches of the armed forces.

SPEED FOUNDRY PRODUCTION WITH DELTA CORE & MOLD WASHES

Actual unretouched photograph of regular production core for 155 mm cast steel projectile coated with DELTA Core and Mold Wash.

DELTA Core and Mold Washes are now being used in practically every modern foundry throughout the nation engaged in the production of armor plate castings, steel cast shells and all other types of castings used for war purposes.

And here are some of the reasons WHY DELTA Core and Mold Washes are so extremely popular

MOISTUREPROOF — When thoroughly dried will not absorb moisture.

NO PRECIPITATION — Stay in suspension indefinitely when properly mixed with silica flour and water.

HIGHLY REFRACTORY — Molten metal lays on surface without the least disturbance.

UNUSUALLY HIGH FUSION — When mixed with good 140-mesh silica flour the fusion point is over 3100° F.

NO GAS — Non-reactive with molten metal and liberate no gaseous vapors.

ADHERE TO SAND SURFACES — Penetrate into sand surfaces which prevents flaking, peeling, scabbing when in contact with molten metal.

EASY TO APPLY — Can be sprayed, swabbed, dipped or brushed onto either green or dry sand surfaces.

PRODUCE SMOOTH SURFACES — Casting surfaces are free from burn-in or metal penetration.

CUT CLEANING ROOM COSTS — Surfaces are smooth and require minimum amount of cleaning.

ECONOMICAL TO USE — Cost less per pound and cover greater surface area than any other core and mold wash.

For grey iron, malleable and non-ferrous castings use DELTA GRAKOAT, BLACKOAT and NON-FERROUS KOAT Core and Mold Washes. They are waterproof and non-reactive in contact with molten metal.

DELTA OIL PRODUCTS CO.

MANUFACTURERS OF INDUSTRIAL & AUTOMOTIVE OILS, GREASES & COMPOUNDS

MILWAUKEE WISCONSIN

There Is No Need to "CHANCE" *INCREASED PRODUCTION*

You needn't "chance" increased production of vitally needed castings for our War Effort if your problem lies in your molding department. Herman Engineers have been supplying the right answer for increasing the efficiency and the output of foundries everywhere. Increasing the production of molding departments 400% and 500% has not been at all uncommon with the use of Herman Molding Machines and improved departmental layout. Herman Molding Machines also cut operating costs by reducing power consumption and maintenance thru exclusive patented Herman design features. It will pay you to investigate what Herman Molding Machines can do to Increase your Production and Reduce your Costs!

MOLDING HERMAN MACHINES

HERMAN PNEUMATIC MACHINE CO., UNION BANK BUILDING, PITTSBURGH, PA.

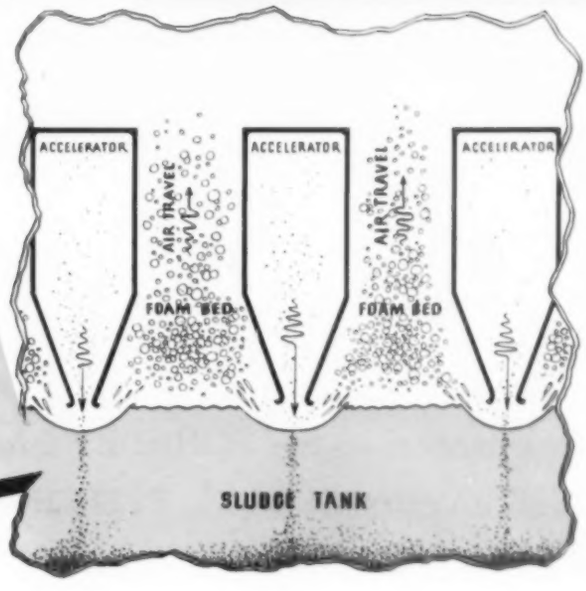
MAHON *Hydro-Foam* DUST COLLECTORS

For operation where dust must be collected from remote points by a system of hoods and ducts. Can be installed as an individual unit or set up in batteries to meet any capacity or requirement.

Automatically deposits dust directly under water from hooded, ventilated work bench, located on one or both sides. Requiring no ducts, it is especially applicable to the processing of magnesium alloys.

. . . collect the SAFE way

. . . deposit dust UNDER WATER



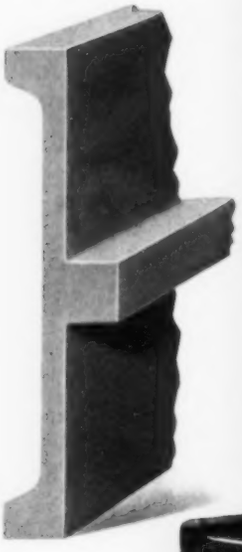
The thoroughness with which Mahon *Hydro-Foam* Dust Collectors clear production areas of harmful dust is due to the ingenious 3-stage method of dust elimination perfected by Mahon engineers. By means of a powerful suction-exhaust fan, the dust-laden air is drawn into the Unit where heavier dust particles drop by gravity into the sludge tank located in the base. Still carrying a considerable volume of dust, the air is then carried into a battery of accelerators, which direct the air downward at high velocity forcing the bulk of the remaining dust into the solution. This impinging action aerates the solution and forms a bed of foam which "smothers" the more minute dust particles and settles them with that previously removed to the bottom of the sludge tank. Thus the dust is trapped the SAFE way—*under water*—as the dust-laden air travels through the Unit and emerges from the exhaust stack thoroughly cleaned. If you are interested in this advanced method of dust elimination whose greater safety, simplicity and economy has been definitely proved in practice, write for descriptive folder—just issued.

THE R. C. MAHON COMPANY
DETROIT • CHICAGO

Manufacturers of

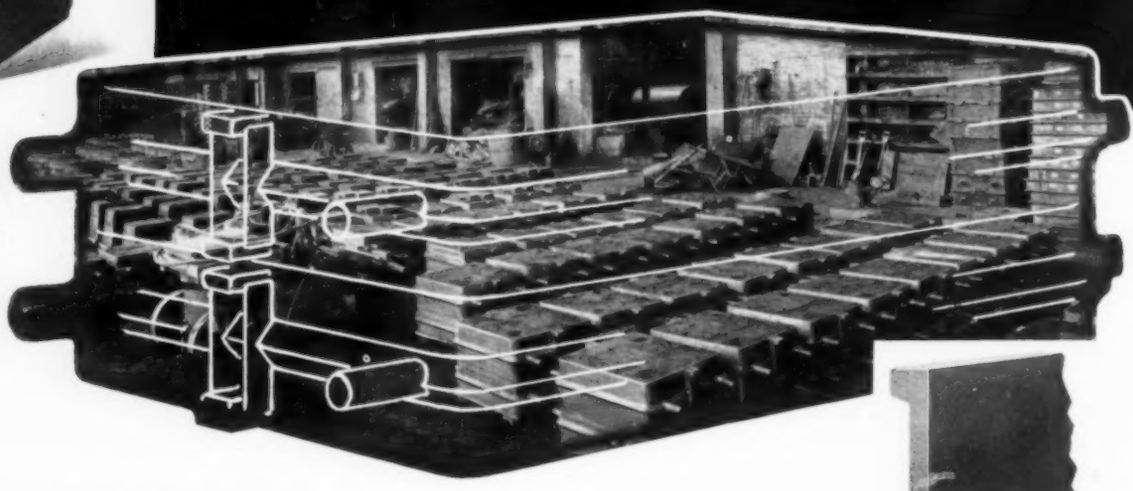
Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Foam Dust Collectors, and Many Other Units of Special Production Equipment — Including Complete Finishing Systems.

MAHON



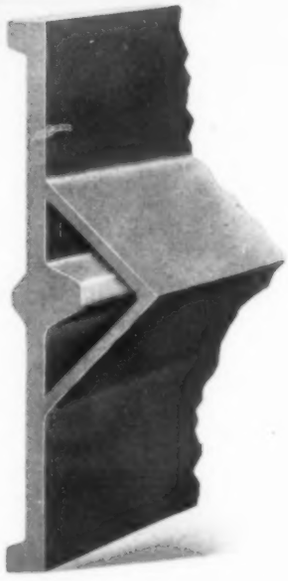
STRENGTH TO SERVE FOR THE DURATION

. . . of Your Plant!



Rolled steel... solid center bar . . . full width bearing. Patent 1974292

FOUNDRIES using Sterling Flasks know they will render distinguished service FOR THE DURATION . . . not merely for the duration of the war, but for the duration of the FOUNDRY itself! These are LIFE-TIME foundry flasks . . . STERLING . . . the flasks preferred by over 3500 American foundries today . . . the flasks that retain rigidity and constant accuracy, even under the toughest 3-shift schedules of *Production Now!* For complete foundry flask service, consult STERLING.



Rolled steel . . . solid center bar . . . angle re-inforced . . . full width bearing.

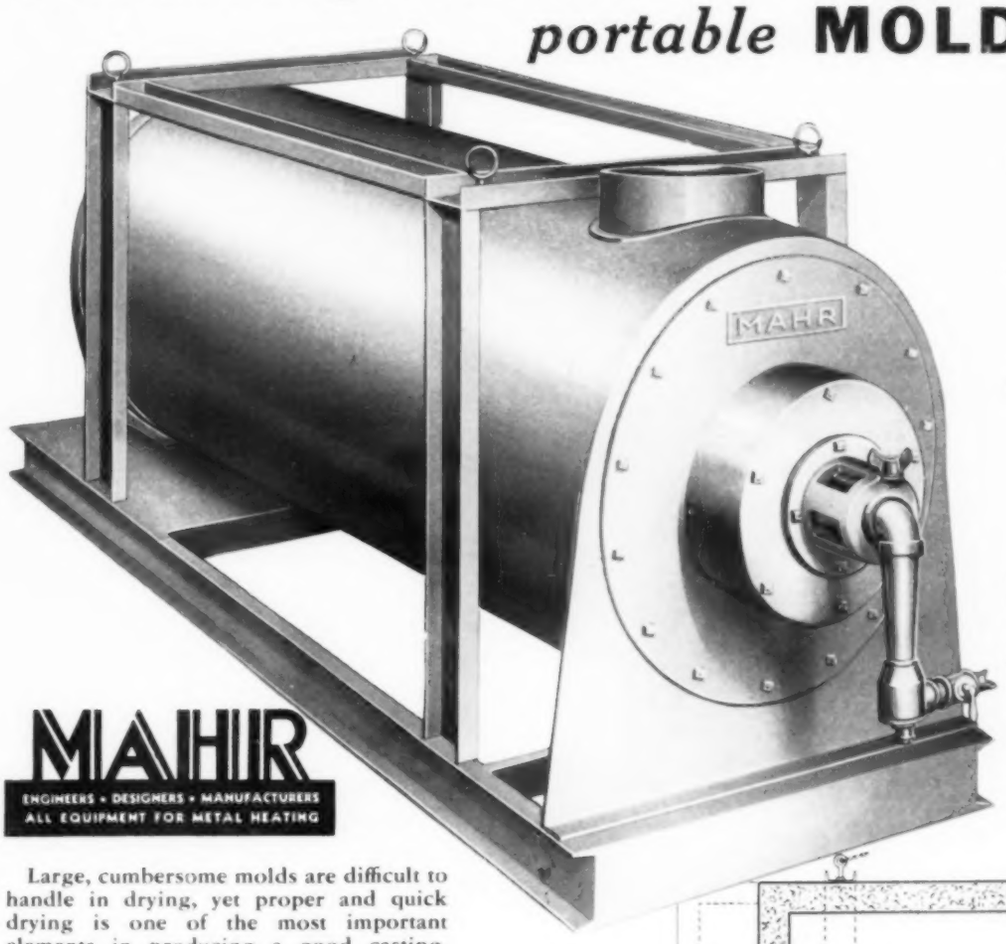
Sterling FOUNDRY FLASKS

Flasks available in all styles and shapes . . . all-welded, special rolled steel sections . . . strong but light, for speed and endurance.

STERLING WHEELBARROW COMPANY • MILWAUKEE, WIS., U. S. A.

A 3824-1F

Announcing the **MAHR High Efficiency** *portable* **MOLD DRYER!**



- **HEAVY STEEL CONSTRUCTION**
- **FAST HEAT-UP QUICK DRYING**
- **FOUR SIZES:**
  - 250,000 Btu Capacity
  - 500,000 Btu Capacity
  - 750,000 Btu Capacity
  - 1,250,000 Btu Capacity
- **OIL OR GAS FIRED**
- **PORTABLE**

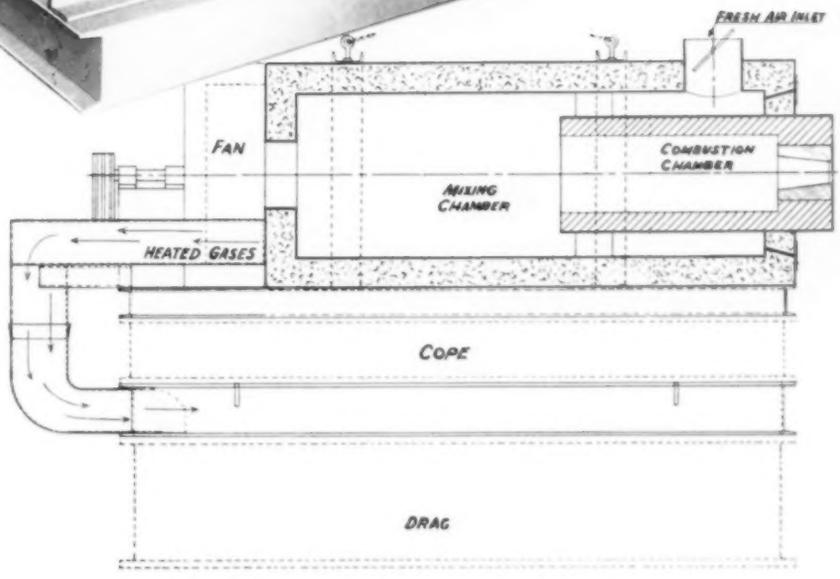
MAHR
ENGINEERS • DESIGNERS • MANUFACTURERS
ALL EQUIPMENT FOR METAL HEATING

Large, cumbersome molds are difficult to handle in drying, yet proper and quick drying is one of the most important elements in producing a good casting. After long and exhaustive study and tests of many drying methods in our own and other foundries, we are proud to announce this newest member of an old family.

Designed by an organization long experienced in industrial heat application, and thoroughly tested under everyday foundry conditions with outstanding performance results. Heat-up time is extremely fast. Large volumes of hot gases are forced into every part of the mold for fast, complete drying. Normal drying times are shortened.

The entire unit is mounted on a heavy channel steel frame, and can be quickly moved and set up for use on any large mold. Fuel may be either gas or oil. Economy in operation is one of its features because of rapid and complete combustion.

FOR OVER A QUARTER CENTURY, the name MAHR has been associated with industrial heat equipment of quality and the most modern design. These products include CORE AND MOLD OVENS, FURNACES OF ALL SIZES AND TYPES FOR ANNEALING, STRESS RELIEF, ETC., FORGES, TORCHES, BURNERS, BLOWERS AND VALVES.



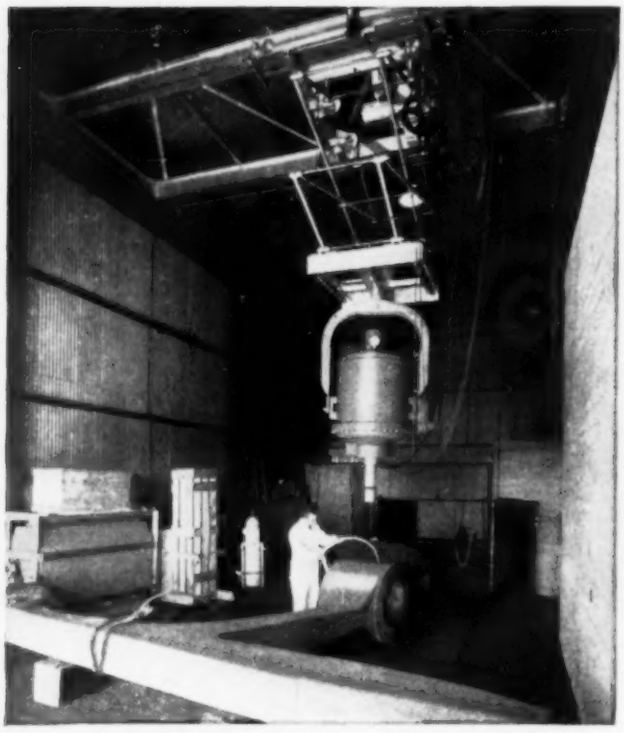
WRITE, WIRE, OR PHONE FOR BULLETIN AND PRICES

Get our fully illustrated and descriptive bulletin telling all about this dryer. It can be used nearly every day in any foundry. With sub-contracts for many very large castings today, several foundries are already using batteries of these dryers with a great saving in time and costs. Write, wire or phone TODAY for complete information.

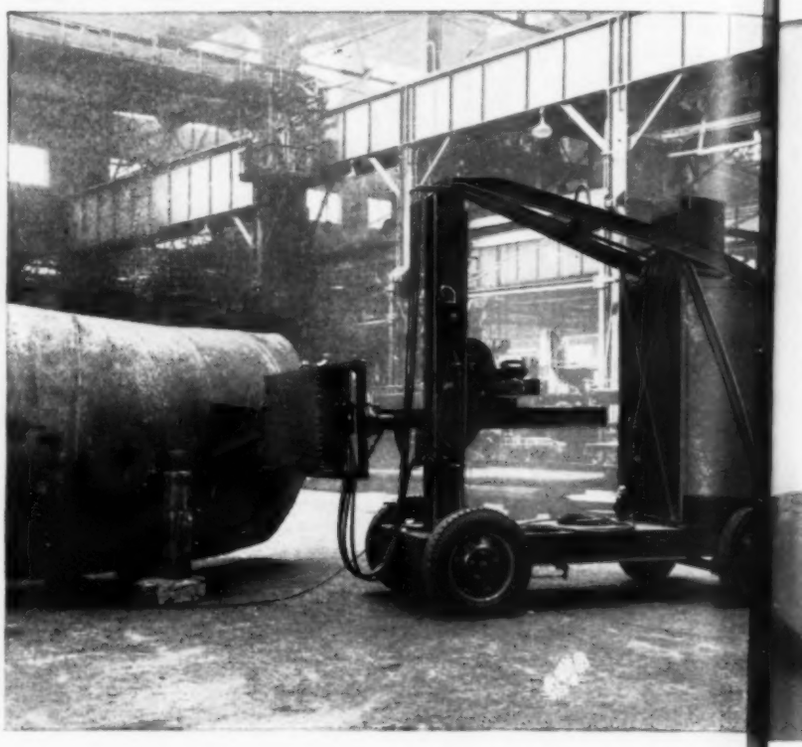
DIAMAHR

MAHR MANUFACTURING CO.
DIVISION OF DIAMOND IRON WORKS, INC.
MINNEAPOLIS, MINNESOTA, U. S. A.

POWER—G-E Industrial X-Ray Units are available in a full range of power up to and including one-million volts. There's a G-E unit with a capacity to meet every need.



FULL FLEXIBILITY is built into every G-E X-Ray Unit to save valuable operating time and to facilitate accurate positioning for all types of industrial x-ray inspection.



INSPECTION PROBLEMS?

★ If you need x-ray apparatus in your inspection facilities, here's a sound suggestion for a full solution of your problem:

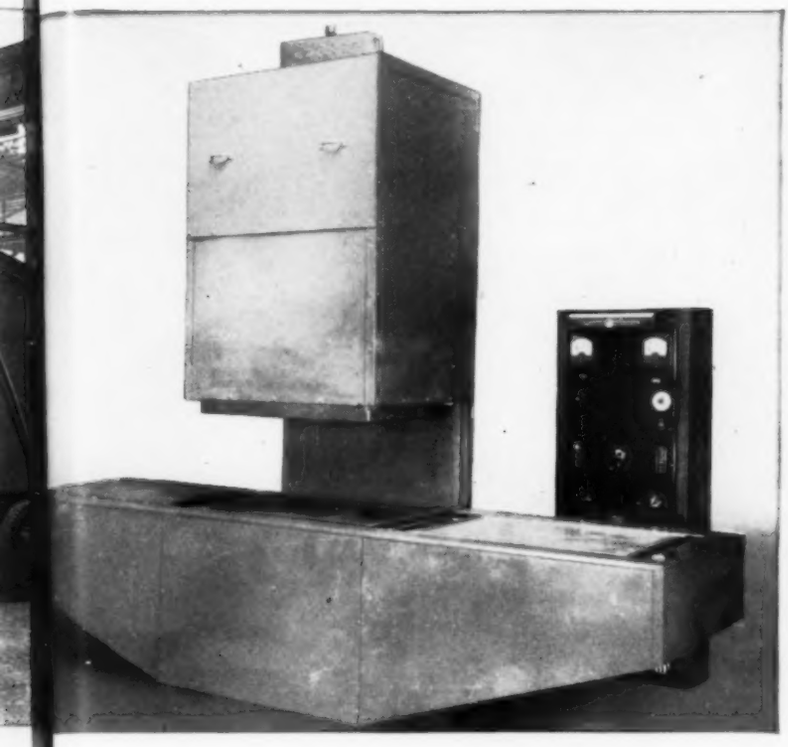
Take advanatage of the services of G-E Industrial X-Ray Engineers. They will help you select exactly the right type of G-E equipment to enable you to enjoy fully all of the benefits of x-ray inspection.

You can rely on the recommendations of G-E X-Ray engineers. There will be no guesswork about them because they will be based on the cumulative knowledge gained in more than 20 years' experience in applying x-ray to the inpection problems of more than 500 of the world's leading industrial plants.

STANDARD UNIT DESIGNS are available in four basic types: Stationary Jib Crane, manual or motor-operated jib travel; Mobile Jib Crane; Mobile Units; Overhead Bridge Crane.

Today's Best Buy – U. S. War Bonds

AUTOMATIC UNIT provides rapid, accurate production-line x-ray examination of castings or metal assemblies. Operators load and unload cassettes; machine does the rest.



BEARING JIG—a new, fast, cost-cutting method for multiple x-ray examination of cylindrical bearings for air-craft, automotive, and Diesel engines.

G-E X-Ray Will Help You Solve 'Em

Shown here are several of the various types available in the complete line of G-E Industrial X-Ray Units. Fast, shockproof, easy-to-operate, they are all designed for heavy-duty industrial service, and you can depend on them to do your job better, faster, and more economically per-unit-inpected.

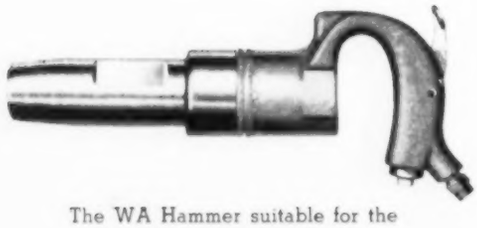
You can save time, insure production, and protect your x-ray investment by investigating G-E Industrial X-Ray Units. For full information, talk with G-E Industrial X-Ray Engineers at our Metal Show exhibit, or write or wire to General Electrical X-Ray Corporation, 2012 Jackson Blvd., Chicago, Illinois. Address Department R39.

NEW, compact, self-contained G-E Industrial Photo-Radiograph Unit inspects small castings for major defects at one eighth-the cost of direct x-ray inspection.

GENERAL ELECTRIC X-RAY CORPORATION

2012 JACKSON BOULEVARD CHICAGO, ILLINOIS

BETTER PUT CLECO CHIPPERS IN YOUR CLEANING ROOM!



The WA Hammer suitable for the heaviest chipping work.

★ Using Cleco Chipping Hammers, your men will get more work done, with less air, and less maintenance costs.

Your men will like them because they are easy to handle and control. The throttle valve graduates the air supply so that the tools are easy to start. Furthermore, these chippers are free from recoil and objectionable vibration that are so fatiguing on the operator.

You will like Cleco Chippers because they "stand the gaff." The plunger and chisel bushing are made of hardened tool steel, ground to close limits. The cylinder and handle are made of heat treated alloy steels for extra strength. The valves are practically leak-proof and breakage-proof.

Another feature of Cleco Chippers is the wide variety of sizes and styles, which insure the selection of exactly the right tool for every job. Available in heavy duty, medium and light models, with open or closed handles. Bulletin 75A gives the full story on these valuable chippers. Ask for it!

●*Other Cleco tools for the foundry include sand rammers, grinders and all types of accessories.*

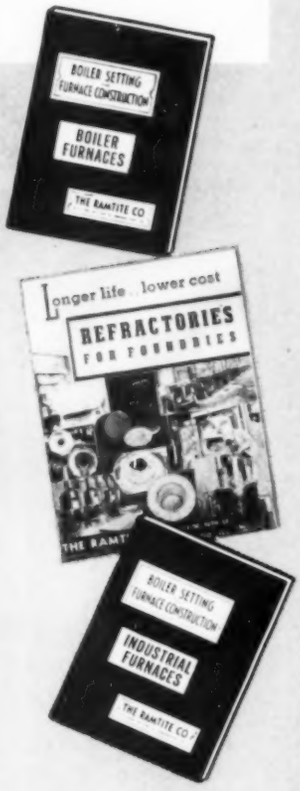
THE CLEVELAND PNEUMATIC TOOL CO.

BRANCH OFFICES IN ALL PRINCIPAL CITIES

MARBLE AVE., AT EAST 77th ST. CLEVELAND, OHIO

Furnace Operators "Get your stuff out faster" WITH RAMTITE PLASTIC REFRACTORY

WRITE FOR THESE PICTORIAL BULLETINS



YOU can produce more . . . do it faster . . . with fewer and shorter shutdowns . . . with Ramtite linings in boilers, melting furnaces, ladles, heat treating and forge furnaces, soaking pit covers, and countless other applications. Send today for one or more of the Ramtite booklets discussed below. Each booklet describes the engineering properties and exclusive construction features of Ramtite . . . together with its special advantages in each case.

★ ***RAMTITE FOR BOILERS.*** Booklet describing the various types of construction, such as Ramtite sectionally supported walls, Ramtite air cooled suspended walls, Ramtite insulated suspended walls, Ramtite suspended arches.

★ ***RAMTITE FOR FOUNDRIES.*** Booklet presenting the uses and advantages of Ramtite and other refractory specialties in steel, malleable, grey iron and non-ferrous foundries. It explains why ladles and melting furnaces lined with Ramtite last longer, have low operating costs and increased output per unit. Various applications are described and instructions are included.

★ ***RAMTITE FOR INDUSTRIAL FURNACES.*** Booklet discussing the application of Ramtite to various kinds of industrial furnaces and contains numerous drawings of such furnaces. Included are forge furnaces, riveting furnaces, heat treating furnaces, soaking pit covers, etc. Mail the coupon today.

THE RAMTITE CO. *Division of The S. Obermayer Co.*
1803 SOUTH ROCKWELL STREET, CHICAGO, ILLINOIS

The Ramtite Co., Chicago, Gentlemen: Please send a copy of the following bulletin—

_____

_____

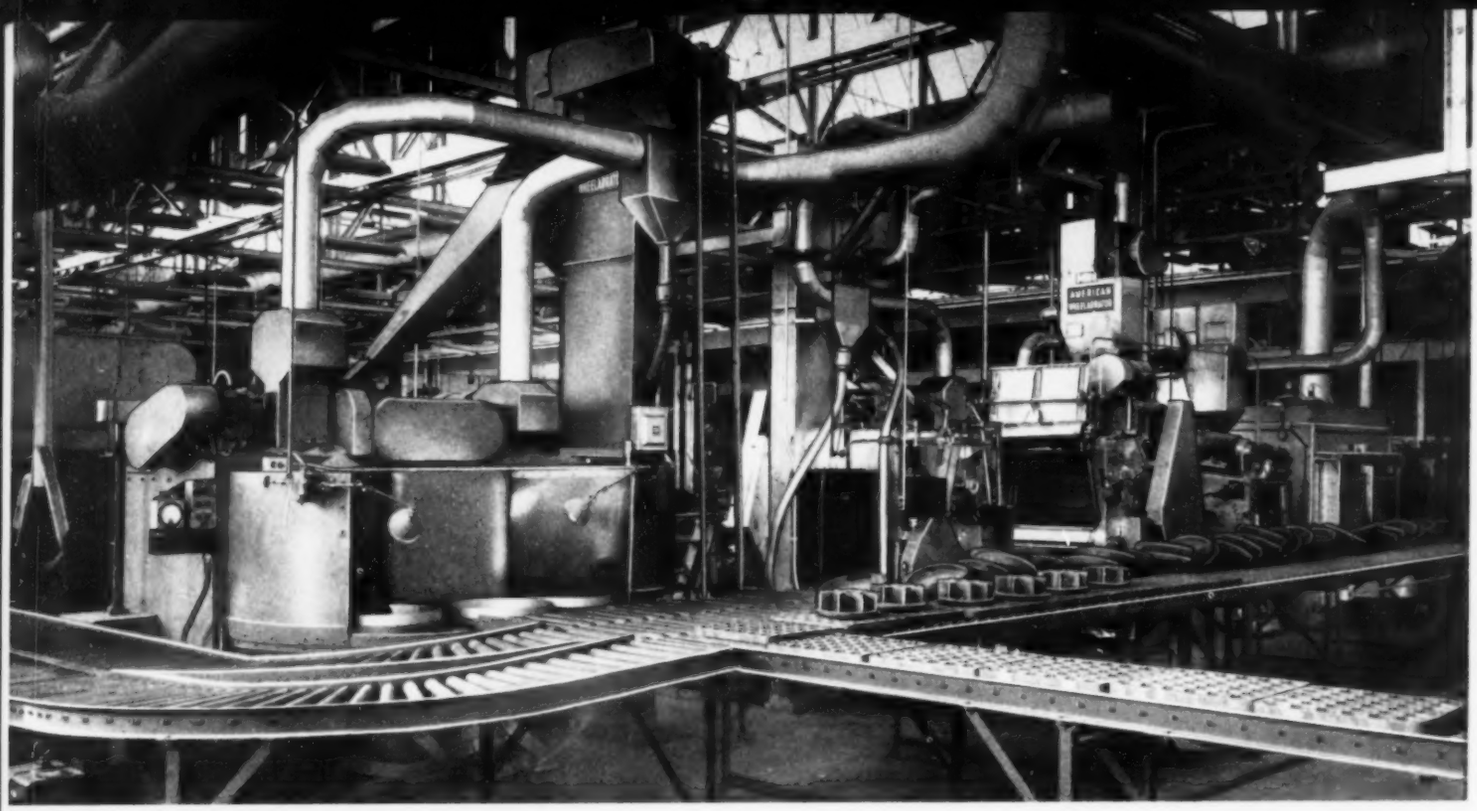
Person _____ Position _____

Firm _____

St. & No. _____

City _____ State _____

RAMTITE



PRODUCTION has to keep "on the move" these days. Very often castings that are poured today are used today—even within the hour. For that reason they have to be cleaned *quickly*. And they have to be cleaned *well*, so that they can be machined or ground rapidly, without dulling tools too fast.

With the airless WHEELABRATOR there is no stoppage in the flow of work, because it cleans big loads in a matter of minutes. And it cleans right down to the virgin metal with a perfection that is evident from the gleaming luster it produces.

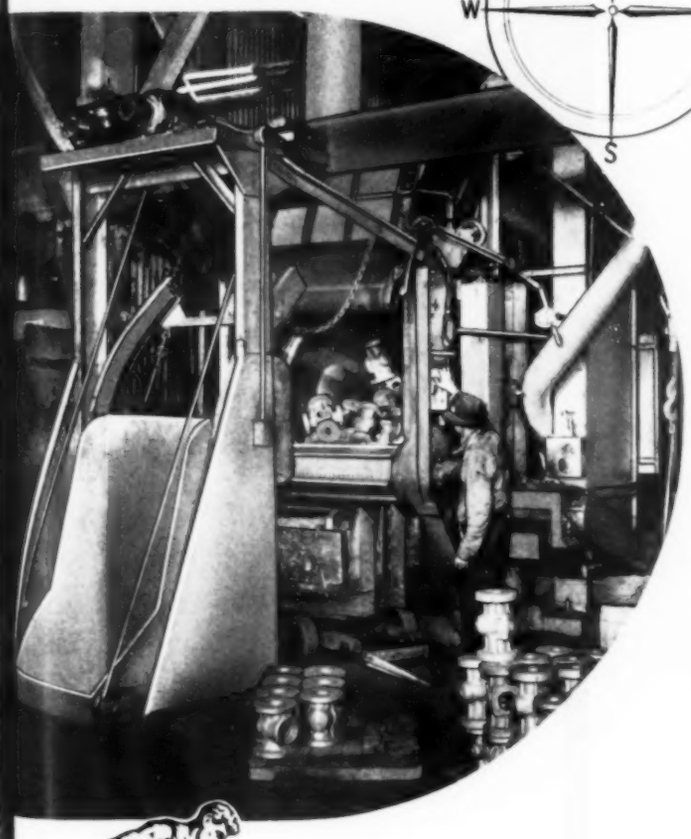
For that reason there is scarcely a war product that is not being Wheelabrated today. The great majority of these products are being cleaned in standard machines. However, where the nature of the job requires a special design, such as shells, bombs, armorplate, etc., we either have a tested and proved machine already designed, or it can be made up quickly, based upon the broad experience we have had in this field.

Advantages of WHEELABRATOR AIRLESS ABRASIVE BLAST CLEANING

1. **HIGH-SPEED CLEANING**—reduces costs, speeds up shipment of orders.
2. **CUTS CLEANING COSTS** up to 50% and more because: it is faster; saves power up to 80%; saves labor; saves time in loading and unloading; saves space; saves abrasive; saves on operating and maintenance costs.
3. **IMPROVED APPEARANCE**—Wheelabrated products are bright, silvery, and uniformly clean.
4. **PROVIDES PERFECT BOND** for final finishing such as enameling, plating, galvanizing, painting, etc.
5. **REMOVES ALL TRACE OF SAND AND SCALE** down to the virgin metal, with the result that:
   - Machining and grinding are faster.
   - Tools last longer.
   - Inspection is simplified.
   - Hardness readings are accurate.
6. **PRODUCES WIDE RANGE OF FINISHES.**
7. **HANDLES WIDE RANGE OF WORK**—from fine springs to heavy armor plate. Ideal for special applications.
8. **ELIMINATES CHIPPED AND ROUNDED CORNERS.**

WINGS
to keep your cleaning production FLYING

Cleaning production is soaring these days because of the extensive use of airless WHEELABRATOR speed-cleaning by foundries everywhere. Faster production with less equipment, less power, less space, less cost is the invaluable contribution the WHEELABRATOR is making toward Victory. Read some of the performance reports shown below.



THE WHEELABRATOR SETS A FAST PACE

CHICAGO, ILL.: A 48" x 72" WHEELABRATOR Tumblast requires only 8 minutes to remove annealing scale and 4 to 5 minutes to rough clean loads weighing from 1,000 to 2,000 lbs. in this large jobbing foundry.

CLEVELAND, OHIO: The installation of a 6' Plain WHEELABRATOR Tablast enabled this large jobbing foundry to reorganize its cleaning department and speed-up shipment of castings to war production customers.

SPARTANSBURG, S. C.: Approximately 22 tons of gray iron castings are cleaned in less than five hours in a 48" x 42" WHEELABRATOR Tumblast at this large textile machinery company.

ROCHESTER, N. Y.: By installing a special two-wheel WHEELABRATOR Cabinet, this railroad parts manufacturer was able to clean reservoir castings much faster, more thoroughly, and at a 50% saving in cost.

MILWAUKEE, WISC.: This large manufacturing company cleans 2,000 pound loads of malleable pipe fittings in ten minutes in a 48" x 42" WHEELABRATOR Tumblast.

TOLEDO, OHIO: This large jobbing foundry cleans forty to fifty tons of green and annealed steel castings in fifteen hours on a special WHEELABRATOR Tablast.

AURORA, IND.: 223,500 lbs. of gray iron castings were cleaned by this medium sized jobbing foundry in the first 18 days' operation with a 36" x 42" WHEELABRATOR Tumblast.

CLEVELAND, OHIO: In the first six hours' operation of a 10' Plain WHEELABRATOR Tablast, 24,000 lbs. of stove and furnace castings were cleaned at this large stove manufacturing company.

CICERO, ILL.: 10,000 pounds of green and annealed large steel castings are cleaned every hour in a 48" x 72" WHEELABRATOR Tumblast at this prominent steel jobbing foundry.

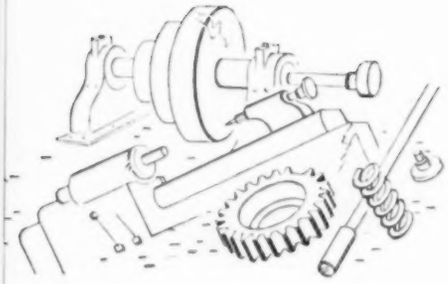
REG. U. S. PAT. OFF.

AMERICAN FOUNDRY EQUIPMENT CO.

Blast Cleaning and Dust Control Engineers

505 SOUTH BYRKIT STREET • MISHAWAKA, INDIANA

WANTED:



6,000,000 Extra Tons of Scrap Iron and Steel

TO KEEP PLANTS RUNNING FOR WAR PRODUCTION

The steel industry must have more scrap iron and steel—not next month or several months hence—but *RIGHT NOW!*

The expected return from regular sources—chips, turnings, borings, clippings, punched-out pieces, etc.—will be 6,000,000 tons SHORT of the tonnage required to produce the steel needed for War Production.

If this scrap isn't obtained *QUICKLY,* steel mills and furnaces—even war production plants—may slow down or shut down. Men may be laid off—and our soldiers may not get the equipment which can mean life or death—victory or defeat. Remember, it takes a ton of scrap for every two tons of steel produced in the open-hearth or electric furnace.

6,000,000 tons of scrap seems like a lot—but if every man in industry turns in every pound, every single piece he can lay his hand on, it can be obtained.

That old obsolete or worn-out machine back in the corner—those broken or worn-out jigs, templates, rolls, patterns, molds, dies, tools and fixtures—that old line shafting and pulleys which will never be used again—that pile of old pipe, gears, castings and what not behind the shop—that old water tank or steel structural work—old autos and trucks—that's the scrap needed here to win the scrap over there.

Everyone can "get in the scrap" by digging up scrap—around the plant and at home, too. Appoint a competent scrap committee—put this story on your bulletin boards (we'll gladly send reprints)—have a special scrap collection day or week—pile up your scrap and call your nearest junk or scrap dealer. He'll pay you for it and start it on its way to a steel manufacturer.

REPUBLIC STEEL — PRODUCTION FOR VICTORY

This Advertisement Sponsored by

REPUBLIC STEEL CORPORATION

General Offices: Cleveland, Ohio

Berger Manufacturing Division • Culvert Division • Niles Steel Products Division • Steel and Tubes Division
Union Drawn Steel Division • Truscon Steel Company • Export Department: Chrysler Building, New York, New York

In Cooperation with the U. S. Government's Salvage Campaign

Foundries Face Curtailment Unless More Scrap Is Brought Out

THE war still is going against the United Nations. Not many battles have been won in the field, and on the home front confusion and bickering, both at Washington and in the factory, are slowing production below schedule, and are producing an unbalanced supply to the fighting forces. Comment from Washington confirms the seriousness of the situation. Robert P. Patterson, under secretary of war, recently told a Cleveland audience "I wish I could tell you today that the war is going well, but I cannot. We still are on the defensive. Reduced to its fundamental fact, this war holds only one choice for us: kill or be killed. There is only one alternative waiting at the end of the road: victory or death." The president's chief of staff, Admiral William D. Leahy, told a radio audience on the first anniversary of the Atlantic Charter that "No pleasant fate awaits a beaten America . . . There are no words to describe the agony of a free people who have been conquered. No fate like that must come to America."

The present situation demands an all out effort on the part of every American. While soldiers, sailors and marines battle on many fronts, at home maximum production of much needed materials and machines must be the one objective. Politics, social gains, greed, strikes and many civilian pleasures and comforts must be forgotten if this nation and its allies ever are to taste the fruits of victory.

Many problems face the ferrous branches of the foundry industry in the tremendous task of providing sufficient quantities of castings to meet the all out war effort. Right now, the one which appears most important in its relationship to production schedules is the matter of scrap. Unless the picture changes for the better shortly, there will not be a sufficient amount of scrap available during the winter to permit maintenance of present operating schedules in the iron and steel industry. In all probability, some foundries now operating on high priority work will be forced to cut production schedules or to shut down entirely. This would be disastrous.

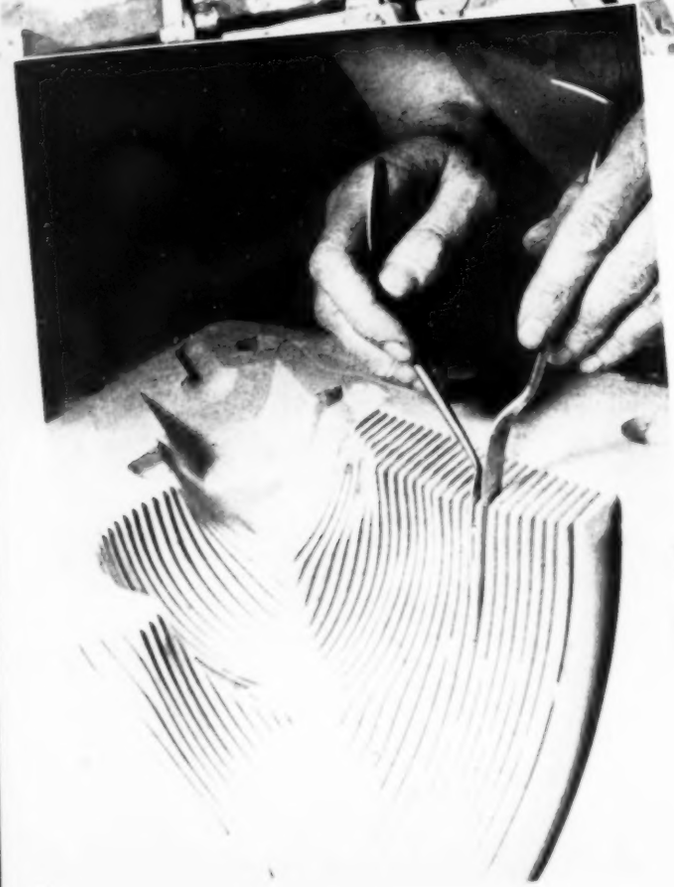
A far reaching campaign now is under way for the voluntary organization of salvage committees in every industrial plant. The War Production Board is co-operating, and Donald M. Nelson, chairman of WPB, recently appealed to all industrial executives for co-operation in the following statement: "The shortage of scrap materials for war production is acute. Six million extra tons of scrap iron and steel alone are needed this year, and vast quantities of rubber, copper, brass, tin, lead, and zinc. Without your immediate active co-operation—whether you have war work or not—we cannot lick this problem. We urge you to organize at once an all-out collection drive in your plants for these materials." If considered only from the standpoint of good housekeeping, all foundries should be participating in this phase of the salvage program.

While this industrial salvage campaign should produce excellent results, the problem of collecting iron and steel scrap must go much further if foundries and steel mills are to continue capacity production of war materials. Large quantities of unused iron and steel are scattered through the country. For example, in spite of all of the previous discussion on the availability of abandoned street railway rail buried in the paving of hundreds of cities, the work of salvaging this material hardly has been started. Delay in recovering the rail generally has been blamed on inability to determine ownership and lack of funds for repairing the street paving. Before this situation becomes too desperate, it might be well for the government to consider taking this material now, filling the holes for the duration with stone, cinders or dirt, and reserving discussion of ownership for a later date.

Local committees have been established in a number of cities, and the spreading of this idea to every community in the country should accelerate scrap collection and aid in solving such problems as now seem to hamper the movement of greater tonnages of scrap through the normal commercial channels. Since the foundry industry has such a high stake in the procurement of scrap, every foundry manager should be serving to the fullest extent those local committees now struggling with the problem, or assisting to set up committees in communities where no organized effort is under way.

Total war, the kind the United Nations must fight to win, demands an all out effort in scrap procurement. It does not seem conceivable that foundries and steel mills will be permitted to slacken their production pace in this time of greatest emergency when the necessary scrap can be found if government, industry and the American people will do a job.

Frank G. Steinebach
Editor



Deep Finned AIRPLANE CYLINDER HEADS Made on Production Line

BY EDWIN BREMER

Fig. 1 (Upper left)—View taken from pouring station showing men in background assembling molds while the inspector in foreground carefully checks the completed mold. Fig. 2 (Lower left)—Thin fins in the mold sometimes must be repaired after removing from the molding machine, and the operation called "buttering" requires steady and skillful hands. Fig. 3 (Center)—Boeing B-17E airplane in flight. Official Photographs, U. S. Army Air Corps. Fig. 4 (Above)—Mold sections ready for assembly after drying

THE man on the street, that inexpert of experts with his vast fund of misinformation on any subject under the sun, is noted for dictatorial pronouncements on all important questions. His vociferous advice on strategy stridently echoes up and down the land, on the football field, at the baseball game, hockey match and other sports. In his spare time he wins battles for generals and admirals, and now and then, without fear or favor, settles industrial problems.

Foundrymen as well as other industrialists are all too familiar with the man on the street's opinions on how things should be done to speed production of quality goods at low cost. They are amazed and dumfounded at the ease with which almost insurmountable obstacles are brushed lightly aside by the uninformed as items of little consequence. Of course, it goes without saying that about at this point the discussion becomes quite strained, and the man on the street departs, muttering about obstinate ingrates.

However, such rebuffs are of small moment to the man on the street. He forgives and forgets easily and, like Phoenix, rises from the ashes as good as new if not better —with improved solutions for all difficulties. It has not been so long since he glibly settled the airplane production problem once and for all. Stop making automobiles and turn the factories over to airplane manufacture! Quite a simple scheme, except for the fact that hardly any of the machines and equipment designed for automobile production could be employed for airplanes.

That does not imply that automotive parts are not required to meet definite specifications on tolerance, because a great many of them do. It simply means that airplane parts must be finished to much closer tolerances. Those parts are made as light and strong as possible to meet amply the severe service requirements. Consequently, since more metal is removed from rough to finished part, there are many more operations and every operation from selection of the rough part to final polishing is conducted under extremely close supervision.

Another important detail that the man on the street dismissed casually is the fact that, until recently, the

Fig. 5 (Left above)—Pouring from furnace into ladle. Fig. 6 (Left center)—Carbonizing or placing a coating of carbon on the mold face. Fig. 7 (Left below)—Cylinder heads after cleaning. Note the deep fins. Fig. 8 (Above)—Setting small wires or nails to stiffen the fins is a tedious operation, but performed comparatively rapidly. Fig. 9 (Below)—Pouring a cylinder head mold

status of the airplane industry was similar to that of the automobile industry 40 years ago. Then each automobile practically was custom built with numerous hand fitting operations. Due to new developments and discoveries hardly two cars were alike as the result of changes incorporated. The automobile industry came into its own only when all features of a particular model, such as the body, chassis, engine, etc., were stabilized or frozen so that mass production methods could be employed to turn out thousands and thousands of identical parts. Even then it took years for the automobile industry to reach its high state of productivity.

Only within the past year has the airplane industry gone to large scale operations. Perhaps the period when various features of construction could be stabilized or frozen to permit application of mass production procedures is even less. But as soon as stabilization was accomplished, the airplane industry made

prodigious strides and in the short space of months, as contrasted to years, entered into its mass production phase. As a result, President Roosevelt's program calling for 60,000 planes by the end of this year is well on its way, according to Donald Nelson.

While, to many, the production of 60,000 planes seems to be small potatoes as compared to millions of automobiles, it must (*Please turn to page* 167)

Fig. 10 (*Above*)—*Assembled molds are placed on boards and pushed along on the roller conveyor to the pouring station. Fig.* 11 (*Below*)—*Sand for the molds is mixed in muller type mixers under careful supervision and control. Fig.* 12 (*Right*)—*Gate must be kept full at all times to insure a good casting*

The Foundry.

A TECHNICAL JOURNAL DEVOTED TO THE FOUNDRY INTERESTS.

Publis

"The Foundry

172 GRISWOLD

J. M. MACFARLANE,
S. E. WHITNEY,
JOHN A. PENTON,

SUBSCRIPTION—ONE DO
States, Canada or
cents per year to all
press, draft, money
stamps. Single copi

CLUB RATES—Eight or
75 cents per year eac

Advertising rates

SUBSCRIBERS can have a
IF YOU FAIL to receive yo
THE FOUNDRY is issued
and will spare no eff
information to those i
in molding, melting,
ment, etc. Persons
industry will confer
by sending him new
pertaining to the fou
theories and experien

DETROIT, SE

50 Years of Service

LATE one evening in the early part of September, 1892, a tall, lean and energetic looking young man carried a rather large bundle into the main post office at Detroit and passed it across the counter to the clerk. The content of this package brought to reality a dream of many months and provided the joy of accomplishment for one possessing boundless energy, complete confidence in his industry and himself, and total disregard for any difficulties that might cross the path he had set about to travel. That young man was the late John A. Penton, and the package contained the first issue of THE FOUNDRY.

With this issue, THE FOUNDRY completes 50 years of service to one of America's most basic industries, and at the same time begins the second half century of leadership in journalistic endeavor. In normal times when the tempo of life permits the leisurely perusal of interesting historical events, the golden anniversary celebration of an industrial journal would require reams of paper and much printer's ink. But global war necessitates postponement of such a celebration to some future decadal birthday. Fifty years in active participation in the progress of the foundry industry will be marked by brief tribute to the individuals and companies who founded and served this publication.

Of course, THE FOUNDRY was made possible through the vision and indomitable spirit of its founder. While many men of the industry told him that such a venture could not succeed, that the industry was not sufficiently important for a paper, and that needed support, both circulation and advertising, could not be found, Mr. Penton decided to go ahead. In the early days he was the editor, advertising manager, advertising representative, circulation manager, bookkeeper, stenographer, mailing clerk, office boy and janitor. But in spite of many difficulties and discouragements, THE FOUNDRY grew in size, reputation, character and influence.

An indication of the growth in influence is found in the following paragraph from an article by the late Frederic B. Stevens, president Frederic B. Stevens Inc., Detroit, on the growth of the foundry supply business, and presented in THE FOUNDRY at the time of its twenty-fifth anniversary:

"The growth of the foundry supply business was aided and accelerated in large measure by a then restless young man, once a machinery molder at Houghton, Mich., who had an ambitious desire to part with the sand heap. While publisher of the *Machinery Molders' Journal*, at Detroit, he conceived the idea of a publication devoted exclusively to the foundry trade, for which he contended there was a field since no journal at that time was in existence. He then interested some of his friends in this project, including a lawyer, an insurance agent, a school teacher and the writer, and so THE FOUNDRY was born with John A. Penton as its editor and publisher. During its youthful career it had its vicissitudes and there were times when the ghost walked—so did the printer—but the indefatigable energy and tireless labor of the Penton brand was back of it all and if the baby edition could be placed beside the present number ocular proof would be presented of just what that energy signifies."

SA

We make our bo
It has been th
foundrymen that
ment of the world'
the iron industry
cation strictly its
less ably looked aft
and trade journa
much literary me
and enjoy a high
some strange an
foundry business
of the procession.

The subject of a
idea. The attemp
although always s
recipients of such
encouragement fr
it has become kn
this step as have

ons for
become
or, su-
ry who
events,
bilious
e regu-
future
Amer-
le me-
e given
tion of
eatures
't to be

what,
of the
will be
unduly

who de-
erests.
Con-
ion to
kind in
higher

verage
ch fur-
mploy-
s of pig
ing for
ere the
where
ritable
tings
h must
law or
nd later
nemical
ty if he
ut few

and demonstrated more completely than anything else could at this time, the existence of a universal demand for a paper whose sole object would be the advancement of the foundry interests and all connected therewith. We have come to stay. THE FOUNDRY is a winner, and will, it is hoped, add one more to the already

to become experienced on the iron mixtures involved in the turning out of a varied class of work until they find themselves face to face with the problem when the next job is in the sand, etc

The great trouble lies in a great number of brands of pig-iron with which the market is flooded, and the need of standard grades and terms

parts o

plied

same

that te

as in

method

standa

of men

cationa

pelled

on som

sell his

the sub

repeati

instruc

We h

way fr

of igno

subject

become

printed

the fac

almost

standin

At n

busines

dries b

months

erection

able in

years a

and aw

the fou

perativ

ern de

vide pl

being

shipme

facture

cranes,

bling barrels, core ovens, etc., are all now considered necessary, while many establishments have gone a step farther, and provided commodious washrooms, closets, etc., fitted with all modern conveniences.

While this is only as it should be, yet to the thinking man it indicates several things. In the first place, the importance of the foundry

as much skill is re-

anagement and to

eded, a desire to

as possible to the

apparent, with the

it, and a knowledge

to have suddenly

that makeshifts no

department of the

e as readily saved

l needed as in the

st improvements.

ONG.

ber of what is des-

paper. Those who

he experience and

l, and are so far

to place that ques-

.

ees of success, and

he very highest it

every foundryman

will not only sub-

s it to others in the

to getting them to

employer, PLEASE

foreman to it, and

tain to derive from

n month to month.

r in your employ-

wn to it, and re-

and aiding him to

l be benefiting him

we would say that

everything that is

gement from time

d thinking molder

terest him than he

source.

be warranted in

antly enlarge, im-

resting these columns, we ask your influence, confident that we will receive it and that you will not regret giving it.

Special rates where eight or more subscribe at one time.

To an Industry

The first issue carried advertisements of the following companies: S. Obermayer Co., Cincinnati, front cover; J. D. Smith Foundry Supply Co., Cincinnati, (now the Smith Facing & Supply Co., Cleveland) inside front cover; J. W. Paxson & Co., Philadelphia; Detroit Foundry Equipment Co., Detroit (now the Whiting Corp., Harvey, Ill.); Huyett & Smith Mfg. Co., Detroit; B. F. Sturtevant Co., Boston; Hamilton Facing Mill Co., Hamilton, Ont.; Buffalo Forge Co., Buffalo; W. A. Jones, Chicago (now the W. A. Jones Foundry & Machine Co.); Garden City Sand Co., Chicago; Hussman Crucible Co., St. Louis; Columbia Brass Foundry, Chicago; Chicago Foundry Supply Co., Chicago; Frederic B. Stevens, Detroit, inside back cover; and Byram & Co., Detroit, outside back cover.

Authors of articles presented during the first year, in the order of their appearance, were as follows: Simpson Bolland, John Pettigrew, W. A. Jones, J. P. Pero, Chas. D. Peet, W. J. Keep, W. Hogue, and Thomas D. West. These men, many of them leaders in the industry, and the scores who wrote letters of encouragement to the editor must be included, along with the early advertisers, as the pioneers of THE FOUNDRY.

During the 50 years since these men wrote of foundry developments, the production of castings has changed from an art into a science. Rule-of-thumb methods that were passed along from generation to generation have been replaced to a large extent by exacting controls which eliminate many of the variables that plagued the industry, and thus permit the production of ferrous and nonferrous castings capable of meeting the most exacting demands of the engineer in designing the mechanisms of war or the machines of peace. Metallurgical science has been applied to cast products, and research, such as that pertaining to molding sands, has improved both production and product. Startling developments in the field of foundry equipment, when compared with the machines available a half century ago, have resulted in the mechanization of most foundry operations, and have made possible the automobile and other high production industries, where castings are used in quantities.

THE FOUNDRY takes great pride in having served this basic industry in its march of progress. Editorially the first issue promised that "THE FOUNDRY will stand squarely for what, in its opinion, are the best interests of the whole business. No section thereof will be overlooked, and the importance of none unduly magnified." This creed has guided the actions of every editor during the entire 50 years, and it will continue the directive force for the editorial policies of the future.

Thus, THE FOUNDRY, which was born during the Gay Nineties, passed through adolescence in the early days of the new century, and became of age just before the outbreak of the first World War, celebrates its fiftieth birthday, and looks forward to the future. No one knows what the morrow will bring, but those now connected with the publication believe the vast experience gained during 50 years when history has repeated itself in booms and depressions, in peace and in wars, will prove most valuable to THE FOUNDRY in its service to the foundry industry during the next half century.

THE METALLURGIST

By FREDERICK A. MELMOTH
Detroit Steel Casting Co.
Detroit

AND THE STEEL FOUNDRY

IN DISCUSSIONS of the qualifications necessary to success in foundry supervision and operation, it is not so long since one ran into a definite and often strongly expressed opinion that the trained metallurgist had little or no place in the foundry. In the opinion of some, he was a sort of modern parasite growth who, without the artisan experience so highly valued in the foundry, merely increased expense, made himself a nuisance generally and could contribute little of any worth to the general good of the industry.

This opinion was not favorably modified by an atmosphere of superiority on the part of some metallurgists, who, with a lack of appreciation of the difficult manufacturing details of foundry work, failed to co-operate as usefully as would otherwise have been the case.

Both sides of this picture have undergone marked revision in the last two decades. Generally speaking, the metallurgist, as his understanding of the other fellow's difficulties developed, has co-operated more fully, and his practical artisan trained colleague has come to realize that through united effort the productive and metallurgical factors can achieve much that was almost impossible prior to this desirable outcome.

Also in this period, engineering progress has seen to it that a foundry holding such opinions has the definite choice either of getting out of business, or confining its activities to some humble portion of the foundry trade, where service conditions call for no particular performance qualities.

Foundry Craftsmanship Is Noteworthy

This remark must not be construed as indicating the slightest disrespect for the foundryman who attained his position in the industry by way of the "sand punching" route, and, the author yields to no one in his admiration of these sturdy characters, of whom he numbers so many among his friends. Such men turned out examples of the molder's art, often in atrocious circumstances, certainly not beaten, if equaled today, on the score of craftsmanship.

Nor is it suggested that any development has occurred to render such men unnecessary. They most decidedly are necessary, and always will be, in my opinion. It is simply a case of changing conditions, due to general progress, which, in the engineering field served by foundries, has been at such rapid rate that performance values of previously accepted materials became outmoded. This applies, of course, to practically all other industrial fields, and research and scientific knowledge has been called upon to back up and extend the skilled craftsmanship which previously was accepted as being almost alone necessary.

The most insistent of "oldtimers" will admit that the most beautifully made casting would be of no use in the world today if it broke or otherwise failed to meet the new conditions imposed upon it by modern engineering demands.

High pressures and high temperatures of operation, vastly increased speed, the necessity for resistance to various corrosive effects and wear-producing media, the modern insistence on the removal of deadweight, with resulting thin sections, all have combined to place upon the foundry the urgent necessity of studying exhaustively all that goes to make a casting. An immediate demand has made modern scientific thought, and the absorption into foundry activity of the rapidly advancing metallurgical knowledge which was developing coincidentally.

The outstanding need of the foundry industry is regularity, and this can only arrive through control of all manufacturing phases. The only method of achieving such control is by scientific education of all problems of production through an increasing knowledge of the fundamentals which are involved. A study of papers submitted to various associations, to the A.F.A. in particular, reveals a greater tendency than at any previous period, to develop fundamental knowledge. Such knowledge is invaluable in the constant efforts of founders to establish control.

Performance Specifications Becoming Severe

In addition, specifications covering performance capabilities of all industrial metals progressively have become severe, and metallurgical discovery naturally pointed the way to a satisfactory meeting of these new conditions. The final heat treatment given to castings rapidly has grown in importance and frequency, and this operation cannot be successful in the absence of scientific and accurate knowledge of the structural changes so affected, and the fundamentals concerned.

A study of the purely metallurgical factors in a foundry led inevitably to the possible effect of many of the materials used in production, such as mold and core materials, and the field of the metallurgist quickly enlarged to take in the study of such effects. This outline probably will show how developing foundry conditions have made the metallurgist of today not a mere visionary, whose impractical viewpoints were liable to create irritation to the craftsman, but rather an absolute necessity if founding is to advance and maintain a respected position in the metal-producing industries.

Turning to the specific application of metallurgical thought in steel founding operations, we find two main phases of production in which the effect has been most prominent. They are, the actual manufacture of the liquid steel, and the final heat treatment of the resulting casting. I will deal with these individually, and endeavor to show the function of the metallurgist and the effect of his work.

To justify his employment in the steel foundry, the metallurgist must demonstrate: (*Please turn to page* 171)

Great Britain Operates Foundries Under War

By Vincent Delport

European Manager, The Foundry

MANY readers of THE FOUNDRY already realized that operating a foundry in time of war necessitates many changes from peace time practice. In Great Britain a certain amount of early planning had been done in anticipation of the war breaking out. Shadow factories had been built and partly equipped, with experience from the last war serving as a guide. As this war spreads in time and space, conditions arise that could not altogether have been foreseen and many new problems have to be studied and solved in the shortest possible time.

Control and distribution of raw materials, the changing over of undertakings from the manufacture of peace time products in a free market, to the production of war equipment ordered by government departments and agencies, labor problems, extension of existing works and the building of new ones, defense against attack by air, increasing costs, are only some of the factors and difficulties with which managements must cope.

An example of the manner in which these problems have been tackled is given by the developments that have taken place at an old established British company. Originally the company was formed to operate coal workings. Ironworks, already existing on the site, were rapidly developed, and the twin enterprises have co-existed ever since. The ironworks have always been closely associated with engineering, one of its specialties being bridge building and other constructional work. The company is also one of the oldest ironfounders in the country. Iron pipes, cast by the company in 1824 and laid as a gas main in a certain part of England, recently were excavated, and were found to be sound and in perfect condition after 111 years in the ground.

In the later years preceding this war the manufacture of castings was concentrated in two foundries. One foundry was highly mechanized and laid out for the economical production of special pipes, bends, tees, etc., for use in pipe lines for water, gas and other purposes. Valve and stop cock boxes and other water engineers' castings, and civil engineers' castings such as gulley grates, manhole covers, etc., also were made in that foundry. The second foundry was laid out for general work of the heavier type, up to 20 tons in weight, such as engine bedplates, cylinders, centrifugal pump casings, acid resisting and heat resisting castings for chemical plant, gas works, etc.

The company now is engaged entirely on war work. While a small proportion of production still includes castings normally made in peace time, but which are required for essential war purposes, the bulk of the output goes directly to war requirements, such as ordnance work, tank tracks, etc. A steel foundry has been added, making manganese steel castings by cupola-converter duplex system. It is interesting to note that the ironfoundry operates on meehanite production.

As regards raw materials, the company derives coal from its own mines. There is no restriction as regards coke, the price of which is controlled. Iron, steel and scrap are obtained through the Iron and Steel Control, now an organ of the Ministry of Supply, which allocates the tonnages required. Steel required for the extension of works or the buildings of new shops also must be requested from, and is allocated by, the Control. It is mainly a question of filling the necessary forms.

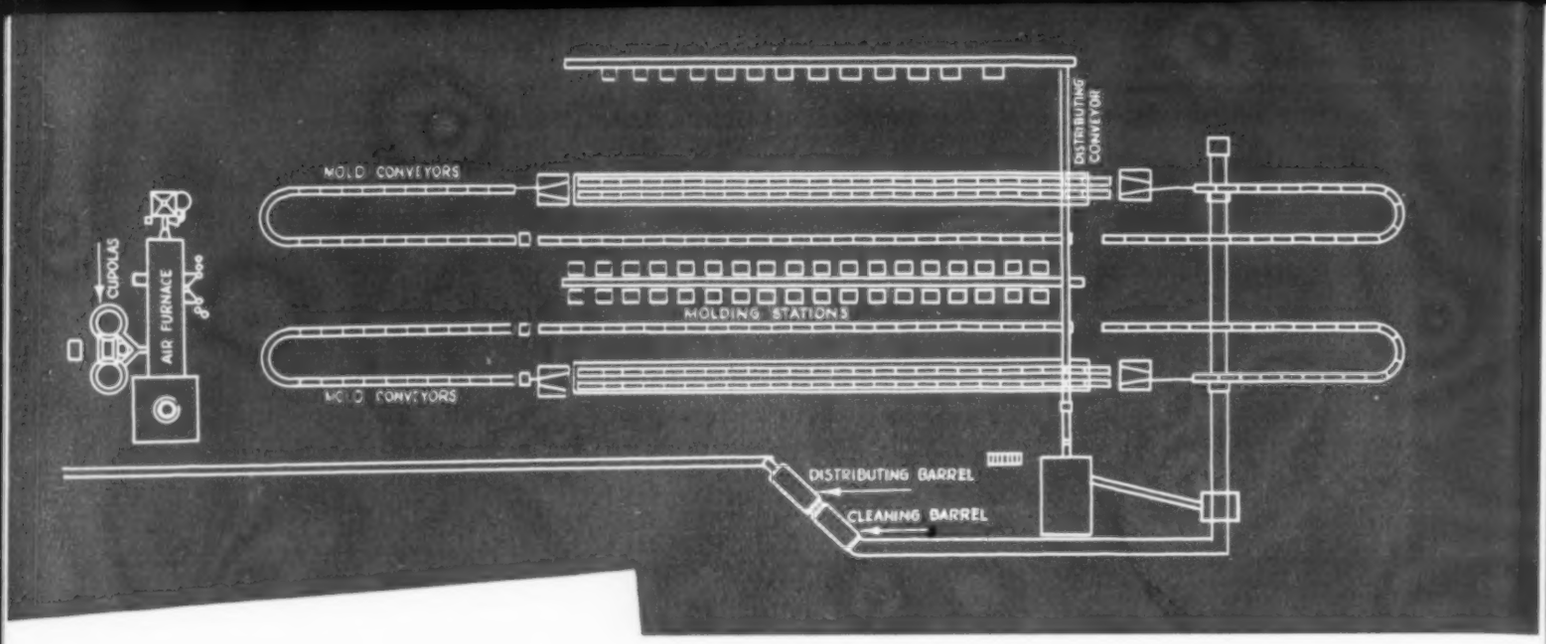
To cope with the constantly increasing demand for more production many undertakings have had to extend and re-organize their works, and this company is no exception since, among other things, the steel foundry is altogether a new addition. This is one of several cases where entirely new foundries have been planned, erected and equipped for the sole object of producing a particular type of casting required for war purposes. Various technical organizations work in close co-operation with the Iron and Steel Control and the Ministry of Supply with a view to equipping new works in the shortest possible time and as efficiently as possible for the particular type of production required. It is interesting to note that the Technical Committee of the Institute of British Foundrymen has played a prominent part in the planning of several specialized foundries, and that in some cases less than 12 months has elapsed between the

Photos by NEA

conception of such a foundry and its starting production. The British Cast Iron Research Association also offers its assistance in solving certain technical problems in the production of iron castings, and the industry itself is represented at control headquarters, specially since the recent formation of the Council of Ironfoundry Associations.

Mention has been made of two major difficulties brought about by war conditions: the necessity for protecting the works against enemy attack from the air, and certain labor problems. Air attacks may occur in the daytime. There are means of detecting the approach of such an attack and information from various sources is received in a control room from which a warning is issued all over the works. Shelters are provided at certain points, where the workers can find protection when bombs fall and there are also a number of first aid posts. Watchers are on duty to detect possible fires due to incendiary bombs, and fire brigades are ready to cope with the incidents. There are certain means of defense against enemy airplanes. The personnel of the works contributes mainly to the various means of protection and is kept constantly trained. This defense service is voluntary. The whole organization, which cannot be described in detail, is conceived with a view to preserving life and reducing to the minimum any inevitable interruption to production that might occur.

At night, when air attacks are as likely to occur, if not more so, than in the daytime, the same precautions are taken, but it is also essential that no lights should disclose the position of the works. At these plants night shifts work in the constructional and machine shops. In the foundries only maintenance and preparation work is performed during the night, but during the short winter days work goes on during (*Please turn to page* 164)



MALLEABLE FOUNDRY

Keeps 'Em Rolling

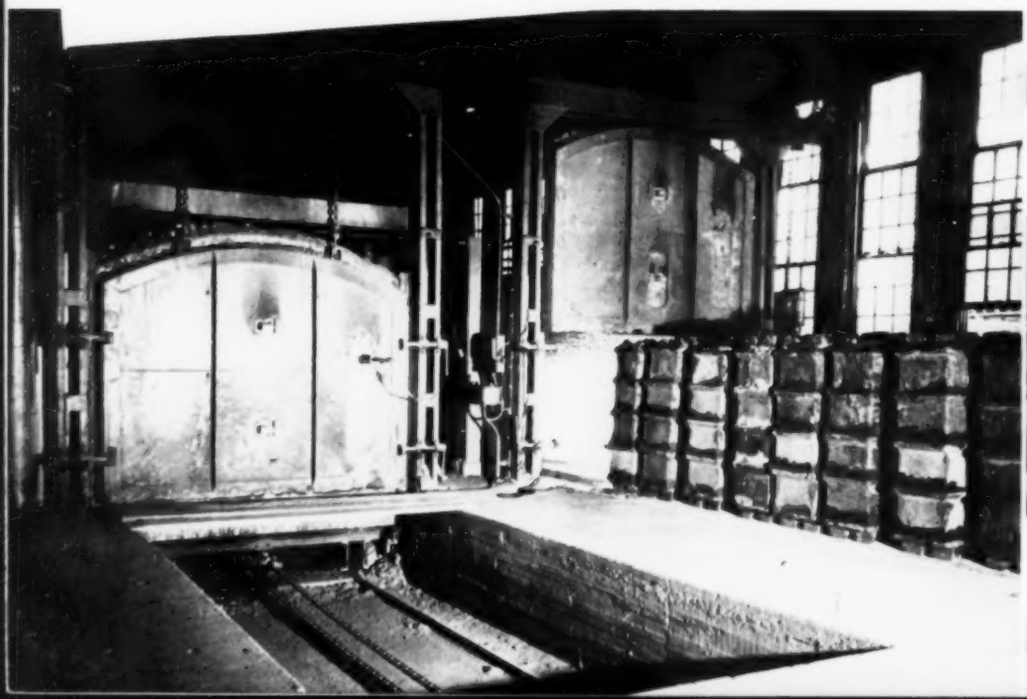
BY PAT DWYER

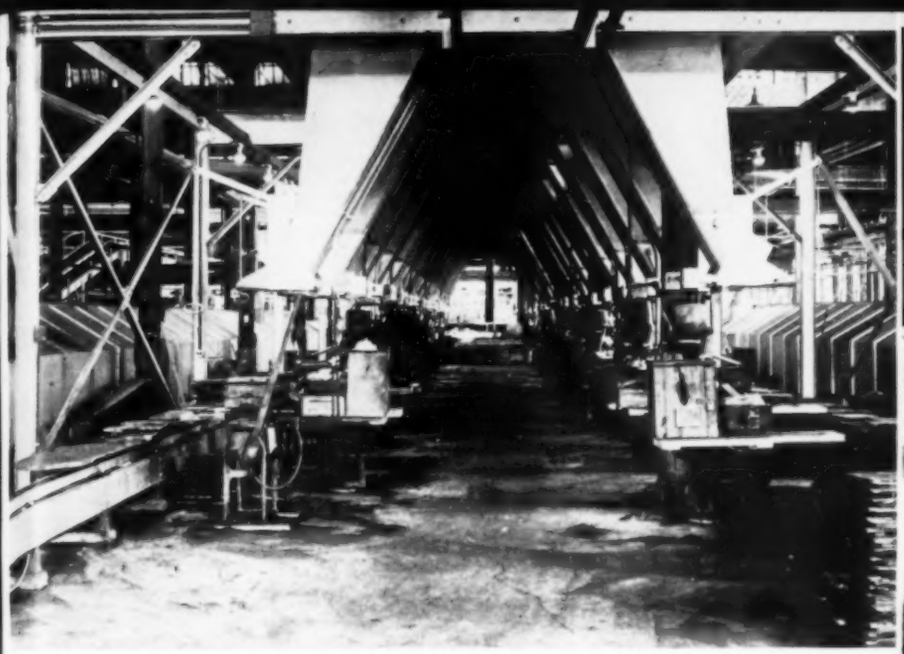
APPROXIMATELY 200 years ago when the slim population of the United States was confined almost entirely to the territory along the Atlantic seaboard and when manufacturing and other industries could be listed in a very small book, Benjamin Franklin said "Take care of your business and you will have a business to take care of."

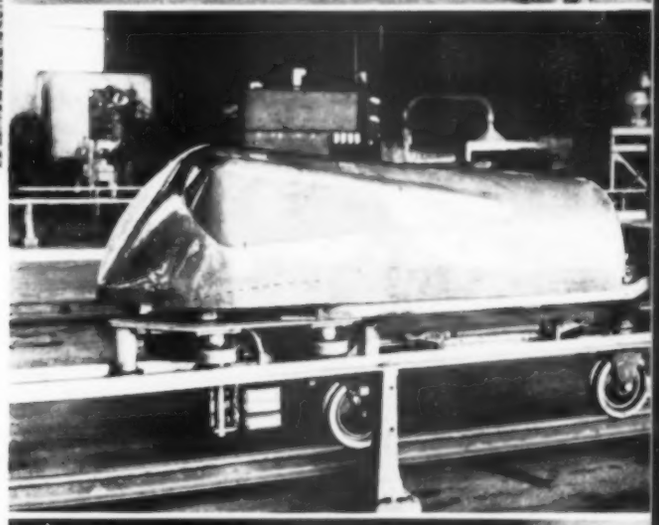
The sentence with a preposition at the end probably provoked an uplifted eyebrow or two among the pedants of that and later days, but there is no record to show that Mr. Franklin lost any sleep or suffered in appetite from that little trifle. The shrewd old philosopher knew what he was talking about. As with all his voluminous comments on a wide variety of subjects his opinion was based on elementary truth, than which there is no more solid foundation.

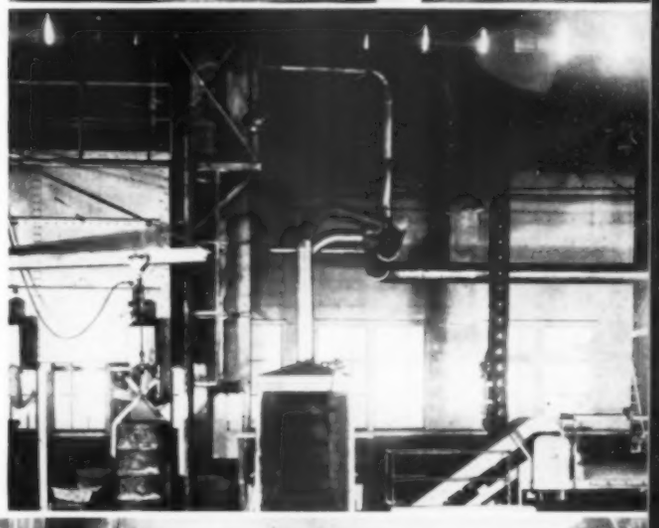
Benjamin was gathered to his fathers April 17, 1790 and therefore was denied the satisfaction of pointing to numberless modern instances that proved the accuracy of

Fig. 1 (Above)—Sketch showing general layout of foundry. Fig. 2 (Left below)—Two of the 13 annealing ovens. Fig. 3 (Right below)—Castings are conveyed from the foundry into the inspection room on a belt where they are inspected, weighed and counted before annealing





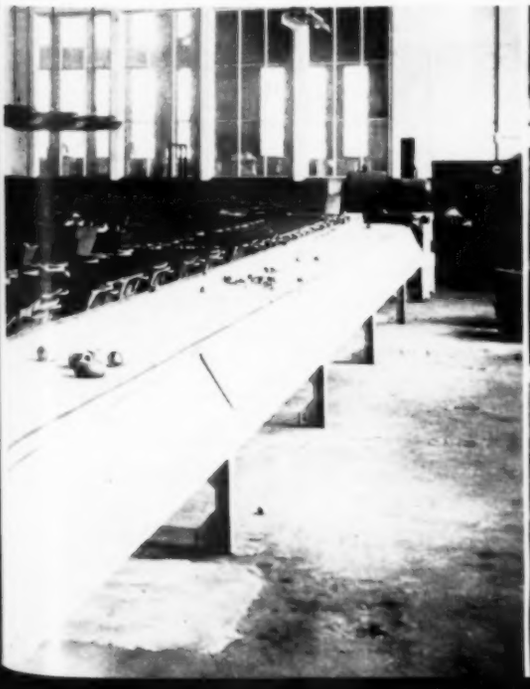




his statement while the country increased in population, in wealth and power and prestige. Since he came originally from Boston he would be particularly gratified in referring any doubting Thomas to the manufacturing industry in New England, an area where tall chimneys with their flowing smoke plumes are almost as numerous now as the trees of the forest in the infant days of the Republic. Picking his way leisurely down the long list, drawing quietly on his long pipe, and on his longer and infallible memory, he could mention many instances of plants commencing in obscure little holes in the wall, that have grown and expanded like the well known green bay tree under the skilled and highly competent management of grandfathers, fathers and grandsons.

In 1864 Emil C. Hammer, Thorvald F. Hammer, James J. Walworth and other Boston men organized the Malleable Iron Fittings Co., Branford, Conn., and purchased the small plant of the Totoket Co., in existence since 1854. Close of the first year's operation by the new company

Fig. 4 (Above)—Molders' stations showing the mold conveyor cars on each side and mold cooling tunnels. Fig. 5 (Above right)—Electric scale-truck and bucket assembles charge. Fig. 6 (Right above)—Third-rail electric locomotive pulls the mold cars. Fig. 7 (Right)—Shaking out the castings. Fig. 8 (Right below)—Melting department



showed a production of 152 tons, or ½ ton per day of malleable iron castings. Through steady growth and expansion the present yearly output is 5000 tons steel castings, 6500 tons malleable iron pipe fittings and 3000 tons miscellaneous malleable iron castings, from a plant that covers 10 acres.

In 1872 Alfred E. Hammer, son of the founder and for many years president and active head of the company, began the study of the chemistry of black heart malleable As related by Mr. Hammer in THE FOUNDRY many years ago "The work was not only interesting but positively exciting. So much so that I had a mattress laid in my laboratory and with the aid of an alarm clock I was able to follow the then tedious chemical operation through the night." As a result he was able to enunciate a

Fig. 9—Metal is poured into the molds on the conveyor cars by ladles suspended on overhead monorails

chemical ratio as between carbon and silicon, and manganese and sulphur. The first positive and definite step in scientific control since Reaumur first produced malleable iron by rule of thumb, or since pioneering Seth Boyden in the early years of the 19th century laid the foundation of the black heart malleable iron industry in Newark, N. J.

Changes, improvements and expansion have continued under the administration of T. F. Hammer, who succeeded his father as president and general manager in 1935. He represents the third generation of a family of famous American iron masters. Recent improvements include conversion of the malleable iron foundry into a highly mechanized unit, clean, air conditioned, free of dust and smoke, where the burden of human labor has been lifted, and where machinery is automatic to a remarkable extent.

Several small air furnaces were removed and were replaced by a single duplexing melting and refining unit near the north end of the building. Two continuous molding units with auxiliary sand preparation and delivery systems, replaced the former setup where long floors extended from batteries of molding machines to the various gangways. A third unit is in construction. In the meantime a certain number of short order and miscellaneous castings are made on a row of floors extending from each of the side walls of the building, to the nearest gangways. Castings are shaken out automatically immediately after they are poured and sent through an intermittent type tumbling barrel from which they are discharged in a steady stream and carried by belt to the sorting and inspection department. Seven of the 13 annealing ovens are fired with powdered coal and deliver the castings in four instead of the 7 to 9 days which formerly were required.

Method of loading and packing the pots before annealing, and the subsequent shaking out after the anneal are worthy of special comment. An exhaust system installed by the American Air Filter Co., Louisville, Ky., collects smoke and dust from every area where generated and provide a clean uncontaminated atmosphere in the building.

In addition to eliminating most of the burdensome features of the work connected with the production of castings, the company installed extensive shower and locker facilities for the employes. As a matter of record the company for many years has exercised a paternal attitude toward its employes, inside and outside the plant. This is an important feature in promoting shop morale and esprit de corps, especially in a small town where 800 employes with dependents represent a majority of the population.

General floor plan of the foundry is shown in Fig. 1 with the cupolas and air furnace at extreme left, 36 molding stations in the center flanked on either side by the mold conveyors, miscellaneous molding floors at the top and the casting conveyor and continuous tumbling barrel at the bottom. A close up of the sand hoppers over the double battery of molding machines and part of the cooling tunnels on either side is shown in Fig. 4. National Engineering Co., Chicago in collaboration with the engineering staff of the Malleable Iron Fittings Co., designed and installed the molding and sand handling equipment without interfering to any material extent with normal production.

One of the most gratifying features in connection with the new equipment is the manner in which production of castings increased, in some instances over 100 per cent. Record days runs of 400 molds are not uncommon with some specially skilled men. This is at the rate of almost one mold per minute. Since the two conveyor lines are identical in every (*Please turn to page* 161)

Casting SILICON BRONZE ALLOYS

SILICON bronzes recently have been made the subject of British Standards War Emergency Specifications No. 1030. This specification with a number of other new or revised specifications, originated in the present urgent need for economy in tin and for the replacement, wherever practicable, of high tin-content bronzes by alloys free from tin or containing lower percentages of that metal.

Although the silicon bronzes are capable of giving reliable castings of good mechanical properties, it is felt that difficulties might be experienced in foundries having no previous experience of these alloys. The Non-Ferrous Sub-Committee of the Institute of British Foundrymen considered, therefore, that while it was not in a position to make general recommendations concerning the use of silicon bronzes as substitutes for tin bronzes or gunmetals, it might be useful to give some guidance on foundry technique to those foundries which may contemplate producing castings in silicon bronzes.

Therefore, the following notes have been prepared on the properties of silicon bronzes and on the technique which has been found successful by those with long experience in the casting of such alloys.

Specify Composition Limits

B. S. War Emergency Specifications 1030 gives the following limits of composition:

Silicon	1.50 to 5.00 per cent
Manganese	1.50 per cent maximum
Zinc	5.00 per cent maximum
Iron	2.50 per cent maximum
Total elements other than copper and those specified above	0.50 per cent maximum
Copper	Remainder

The mechanical properties called for in the specification for either separately cast or cast-on testbars, are:

Ultimate tensile stress, 20 tons° per square inch minimum.

Elongation, 15 per cent minimum.

°Editor's note: The British ton herein referred to contains 2240 pounds.

The silicon bronzes are capable of giving close grain, homogeneous castings of high strength, toughness, good resistance to corrosion and suitability for pressure work. When molten they are very fluid, producing sharp and well-defined castings from sand molds. They can also be cast by the centrifugal process and in chilled molds.

Silicon bronzes possess approximately the following characteristics:

Density (cast)	8.4 grains per cubic centimeter
Weight per cubic centimeter	0.92 pounds
Shrinkage	5/32 to 3/16 inch per foot

In practice the mechanical strength of silicon bronzes ranks well above that obtained with the gunmetals and similar alloys in which tin is an important constituent. Standard test-pieces cast in green sand give the following average properties:

Ultimate tensile stress, tons per square inch	22
0.1 per cent proof stress, tons per square inch	9
Elongation per cent on 2 inches	20
Brinell hardness (10 millimeter ball, 500 kilograms load)	90

Silicon bronzes may be melted without difficulty in pit fires or tilting furnaces of the coke-, oil- or gas-fired types. Melting should be carried out as quickly as possible, exposure to the furnace atmosphere being kept to a minimum. The melt may be kept well covered with a gasless flux, such as ordinary bottle glass, cryolite or sal-ammoniac. In cases where the liquid slag is very fluid, a sprinkling of dry silica sand may be used to thicken it so that it may be skimmed readily prior to casting.

Molten metal should not be allowed to remain in the furnace too long after the casting temperature has been attained. Excessive stirring or puddling during melting should be avoided, as this is not only unnecessary but tends to disturb the protecting cover, and may cause gas pockets in castings as a results of contamination of the metal by furnace gases. The metal should be stirred with a graphite stirrer or a coated iron rod. Care should be taken not to overheat the alloy.

May Add Scrap To Charge

Scrap can be added to furnace charges in the usual amounts without detriment to the castings produced. However, great care should be observed that no damp or oily scrap is melted in that condition. The average casting temperature is in the neighborhood of 1130 degrees Cent. (2066 degrees Fahr.), this being modified as required to suit thick or thin sections. The alloy has considerable fluidity, therefore thin sections can be cast successfully.

The characteristic of all silicon bronzes is their short freezing range, approximately 50 degrees Cent. (112 degrees Fahr.), and shrinkage therefore takes place at a greater speed than in the gunmetals. This necessitates special attention to the feed requirements, heads and runners of generous size being required.

Various molding methods may be employed for casting silicon bronzes providing the previously mentioned points receive due attention. Where design of the castings is such that adequate feeding metal cannot be introduced, chilling may be resorted to (*Please turn to page* 158)

CONVERTER CAST STEEL

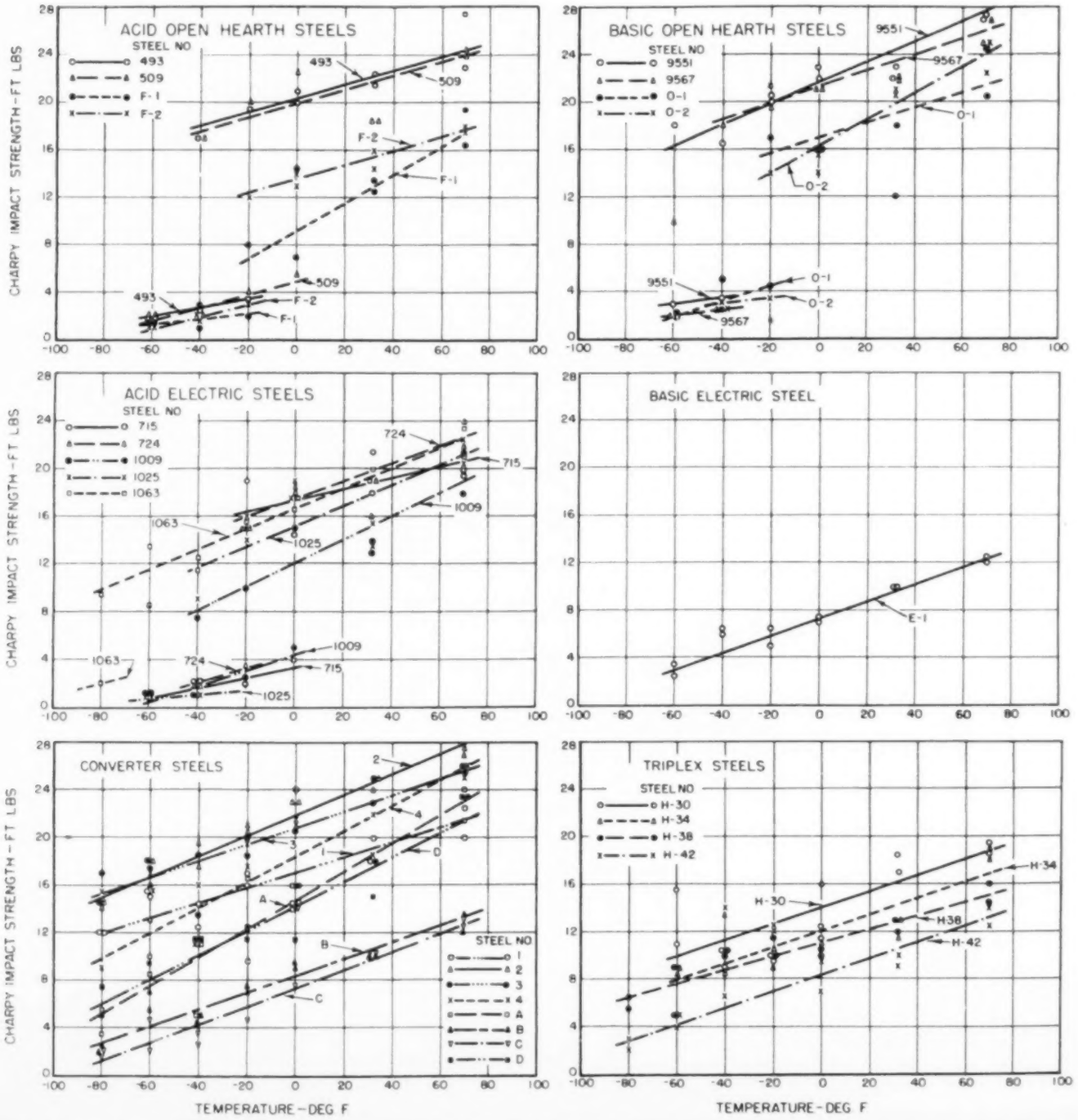
Will Meet Requirements

By C. E. SIMS and F. B. DAHLE

Battelle Memorial Institute
Columbus, O.

NOW that side-blow converter cast steel can be made to the same chemical composition as acid open hearth or acid electric cast steel, the present question is, does it nevertheless differ essentially in mechanical properties? It seemed that an appraisal of these properties was in order.

An investigation was sponsored by the Whiting Corp., Harvey, Ill. for the purpose of determining the facts, and contemplated as a follow-through a study of means to correct any deficiencies that might be found. All of the steels used were from regularly produced commercial heats.



It is recognized that steel castings are products of three factors: (1) the inherent engineering properties of the steel that is used, (2) the mechanical integrity of the casting, and (3) the heat treatment.

The mechanical integrity of a casting is largely a matter of foundry technique, and no attempt was made here to determine whether, as is often claimed, converter steel has superior castability. The heat treatment was a constant, and the investigation was concerned only with the comparative engineering properties of these steels, under standardized conditions.

Specimens of cast steel for testing were solicited from various commercial foundries. These specimens were in the form of coupons cut from keel blocks. All specimens were from the same design of keel block, except two heats (9551 and 9567, Table 1), which differed only by being slightly greater in cross-section. The processes represented by the specimens are as follows: acid open hearth, basic open hearth, acid electric, basic electric, triplex (cupola-converter-electric), and side-blow converter.

An effort was made to obtain at least two heats of each type from each contributing shop and to have two shops represented by each process. Triplex heats were obtained from only one shop and only one basic electric steel was secured.

The request was made that all of these steels represent the current standard practice in use at any particular shop. The only exception to this was in converter heats 4 and C in which it was requested that titanium be used in addition to the regular deoxidizers and in converter heat D in which an addition of 2 pounds of aluminum per ton was requested.

In view of the prevalent use of aluminum in cast steels, the normal expectation would have furnished some open-hearth or electric steels deoxidized with aluminum. Such unfortunately was not the case and, in view of the trend of the results, two acid electric heats deoxidized with 2 pounds of aluminum per ton were later especially requested. Only one of these, heat 1163, was acquired in time for inclusion. This came from the same (*Please turn to page* 151)

Fig. 1 (*Left*)—*Low temperature notched-bar impact strength of cast steels*

TABLE I.—CHEMICAL ANALYSES OF GRADE "B" CAST STEELS.

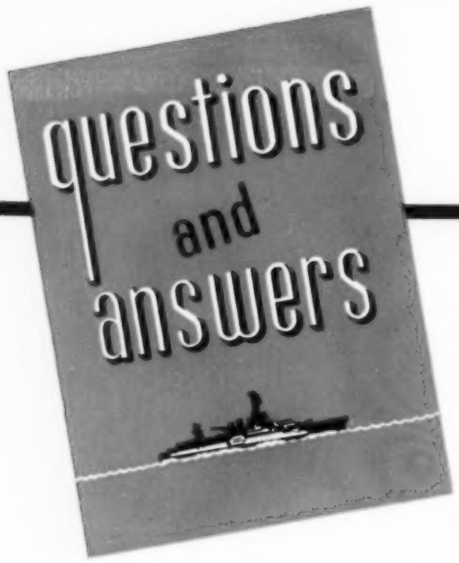
Steel	Carbon, per cent	Manganese, per cent	Silicon, per cent	Phosphorus, per cent	Sulfur, per cent	Residual Metals: Copper, per cent	Residual Metals: Chromium, per cent	Residual Metals: Nickel, per cent	Residual Metals: Molybdenum, per cent	Residual Metals: Nitrogen, per cent	Special Deoxidizers Added to Ladle, lb. per ton: Al	Fe Ti	Ca Si	Ca Si Mn
Acid Open Hearth Steels														
493	0.21	0.69	0.42	0.030	0.035	0.11	0.05	0.01	0.006	0.006	...	2	3	...
509	0.24	0.66	0.47	0.036	0.035	0.12	0.04	0.01	0.006	0.005	...	2	3	...
F-1	0.33	0.67	0.36	0.036	0.036	0.05	0.02	0.04	0.060	0.005	...	...	...	...
F-2	0.30	0.85	0.37	0.035	0.033	0.04	0.02	0.04	0.051	0.006	...	...	...	...
Basic Open Hearth Steels														
9551	0.27	0.58	0.46	0.013	0.025	0.15	0.14	0.06	0.016	0.005	...	...	...	...
9567	0.27	0.68	0.45	0.019	0.034	0.10	0.12	0.05	0.012	0.005	...	...	...	...
O-1	0.32	0.72	0.34	0.017	0.027	0.12	0.05	0.15	0.04	0.004	...	...	...	...
O-2	0.30	0.77	0.34	0.016	0.029	0.12	0.06	0.17	0.03	0.004	...	...	...	...
Acid Electric Steels														
715	0.27	0.80	0.45	0.027	0.034	0.06	0.05	0.03	0.013	0.008	...	3	...	3
724	0.26	0.72	0.39	0.026	0.036	0.08	0.03	0.06	0.009	0.008	...	3	...	3
1009	0.26	0.68	0.40	0.034	0.038	0.11	0.06	0.18	0.038	0.010	...	4	...	1.5
1025	0.24	0.66	0.39	0.035	0.040	0.11	0.06	0.16	0.034	0.009	...	4	...	1.5
1163	0.26	0.68	0.49	0.036	0.037	...	...	...	...	0.009	2	...	...	...
Basic Electric Steels														
E-1	0.34	0.88	0.28	0.033	0.035	0.12	0.19	0.43	0.06	0.007	0.7	...	...	...
Converter-Acid Electric Steels (Triplex)														
H-30	0.30	0.73	0.40	0.029	0.035	0.36	0.04	0.08	0.056	0.011	[a]	...	2	...
H-34	0.34	0.78	0.40	0.033	0.036	0.39	0.04	0.06	0.062	0.011	[a]	...	2	...
H-38	0.33	0.58	0.31	0.023	0.041	0.38	0.03	0.08	0.005	0.012	[a]	...	2	...
H-42	0.35	0.73	0.35	0.059	0.047	0.43	0.03	0.10	0.004	0.010	[a]	...	2	...
Converter Steels														
1	0.26	0.77	0.55	0.034	0.041	0.19	0.04	0.09	0.008	0.008	2	...	...	...
2	0.26	0.66	0.38	0.032	0.027	0.09	0.04	0.06	0.006	0.009	2	...	...	...
3	0.27	0.65	0.37	0.038	0.026	0.09	0.05	0.06	0.007	0.009	2	...	...	...
4	0.26	0.50	0.32	0.033	0.028	0.14	0.03	0.05	0.007	0.009	2	2	...	...
A	0.29	0.50	0.33	0.040	0.031	0.09	0.02	0.085	0.008	0.006	1	...	...	...
B	0.33	0.85	0.43	0.043	0.035	0.09	0.02	0.072	0.018	0.008	1	...	...	...
C	0.33	0.64	0.39	0.049	0.038	0.10	0.03	0.079	0.018	0.007	1	1.7	...	...
D	0.29	0.73	0.36	0.044	0.035	0.09	0.03	0.077	0.014	0.007	2.25	...	...	...

[a] Aluminum added to electric furnace in these heats.

TABLE II.—MECHANICAL PROPERTIES OF GRADE "B" CAST STEELS.

NOTE.—Tensile values and Charpy impact values are averages of duplicate tests. Izod values are averages of three tests.

Steel	Yield Strength, psi.: As Normalized	Yield Strength, psi.: As Normalized and Drawn	Tensile Strength, psi.: As Normalized	Tensile Strength, psi.: As Normalized and Drawn	Elongation, per cent: As Normalized	Elongation, per cent: As Normalized and Drawn	Reduction of Area, per cent: As Normalized	Reduction of Area, per cent: As Normalized and Drawn	Brinell Hardness As Normalized and Drawn	Impact Strength As Normalized and Drawn, ft-lb.: Izod	Impact Strength As Normalized and Drawn, ft-lb.: Charpy	A.S.T.M. Grain Size Normalized and Drawn	Type of Sulfide Inclusions
Acid Open Hearth Steels													
493	49 000	46 500	74 500	74 500	33.5	32.0	57.0	55.5	147	34	25	7 to 8	I
509	46 000	43 000	75 000	75 000	33.0	34.0	57.0	56.5	142	32	24	7 to 8	I
F-1	46 500	46 000	84 000	83 000	28.0	29.0	47.0	46.5	162	22	18	6 to 7	I
F-2	49 000	47 500	86 500	87 000	29.5	29.0	49.5	49.5	169	22	18	6 to 7	I
Basic Open Hearth Steels													
9551	45 000	45 500	74 000	75 500	29.0	33.0	38.0	56.5	144	40	27	6 to 7	I
9567	46 000	46 000	78 000	79 500	31.5	32.5	56.5	57.0	150	36	26	7	I
O-1	48 500	46 500	82 500	81 500	31.0	31.5	52.5	52.5	162	34	22.5	7	I
O-2	47 500	48 000	80 000	80 500	32.0	33.0	53.5	55.5	157	29	24	6 to 7	I
Acid Electric Steels													
715	56 000	48 000	83 000	81 000	28.5	28.5	49.0	49.5	165	28	20	8	I
724	52 500	47 500	80 000	80 000	30.5	30.0	54.0	54.0	157	29	23	8	I
1009	50 500	49 000	82 500	82 000	29.0	30.0	53.0	52.0	162	25	20	7	I
1025	47 000	47 000	78 500	78 500	32.0	30.5	53.0	54.5	155	27	21.5	7	I
1163	47 000	46 000	75 000	75 000	27.0	29.0	40.0	45.0	142		22	7 to 8	III
Basic Electric Steels													
E-1	59 000	60 500	92 000	93 500	20.0	23.0	26.5	33.0	188	19	12	7 to 8	II
Converter-Acid Electric Steels (Triplex)													
H-30	58 500	53 500	84 500	87 000	28.0	26.0	44.5	35.5	170	34	19	8	III
H-34	58 000	55 500	87 500	87 500	25.5	24.5	35.0	37.0	174	33	18.5	8	III
H-38	47 500	47 500	81 000	81 000	20.0	24.0	29.0	33.5	157	27	15	6 to 8	III
H-42	61 000	55 500	90 000	91 500	23.0	23.5	32.0	30.0	176	21	13	8+	III
Converter Steels													
1	53 000	53 500	80 500	81 000	29.5	31.0	45.0	49.5	155	38	21	8	III
2	47 500	46 000	74 500	75 000	28.0	33.0	42.5	55.5	146	44	28	8	III
3	48 500	48 000	76 500	77 500	27.0	31.0	44.5	53.0	152	42	26	7 to 8	III
4	47 000	47 000	72 500	73 500	29.0	31.0	47.0	50.0	143	43	25.5	8	III
A	46 000	44 500	77 000	76 500	28.9	31.5	40.5	52.0	148	28	23	7	III
B	59 500	58 500	87 500	88 000	19.0	24.0	22.5	34.5	172	26	13	8	II
C	55 500	55 000	85 500	85 000	22.5	23.5	32.0	31.0	168	30	13	8	II
D	52 000	50 000	81 000	80 000	27.0	30.0	47.0	48.5	157	39	23.5	7 to 8	III



Casting Brass Bars in Permanent Molds Requires Experience

Have you any information on casting of solid bronze bars in permanent molds?

Casting of solid bronze sticks and cored bars in permanent molds has been the ambition of a great many foundries, but considerable experimental work must be performed before any measure of success can be expected. Dimensions of the casting, such as wall thickness, overall length, etc., must be considered. Thickness of the mold is governed by the amount of bronze to be chilled. Since you probably will have a wide variety of bars to be cast, an equal number of molds will have to be on hand, which vary in size and thickness.

Care and maintenance of the mold surface is important. Some type of coating will be needed to prevent the scum that forms on bronzes from becoming entangled in the skin of the castings through sticking on the mold surface. Surface defects of that kind require turning off considerable metal, resulting in high machining and high metal costs.

If you are trying to develop a chilled structure to increase bearing life, the casting must be made close to size, and the chill mold designed to produce the desired structure at the proper place. If the bearing surface is internal, then chilling the exterior will be of little help. Thus, you can see that use of permanent molds requires considerable skill obtained by experience to insure a product that can be duplicated whenever desired.

Briquetting Cast Iron Borings Is Satisfactory Procedure

Due to a shortage of scrap iron, we are converting steel scrap back to gray cast iron. That in turn is used in our cupola with commercial pig and gray iron scrap for production of castings. We have available a good supply of cast iron borings and would like to add that material to the stream or ladle of the synthetic gray iron. We have experienced difficulty in getting the molten iron to take up the loose borings due to their buoyancy. Do you know of any successful method which could be used to introduce the borings in large quantities to the stream or ladle?

We believe the most satisfactory method of using borings is in the form of briquets. It is impractical to melt borings loose in the cupola or to add them loose in the stream or ladle as you already have discovered. They can be melted in the electric furnace. One method using that furnace is to melt down or pour some liquid iron or steel, and add the borings. Pour some more iron or steel in the liquid form on top and melt the mass down. That may be rather uneconomical since power cost would be high.

Another method, which is being used successfully, is to place the borings in sheet metal containers similar to lengths of stovepipe, or in large cans such as canned goods for restaurant use are shipped in. Those are charged into the cupola with the other raw materials. By the time the tube or can, which is made of thin material, has been melted, the borings are fairly well fused, and consequently do not blow out or burn up so readily. In moderate amounts, remelting would not be necessary, and the material in the tube could be included in the regular charge.

Elongations on Nonferrous Bars Vary Over a Wide Range

We are making castings from grade 2 alloy shown in specification QQ-B-691a which calls for minimum of 30,000 pounds per square inch tensile strength, and 20 per cent elogation. Our elongations vary from 11 to 40 per cent. Pouring temperature of the test bars is 2000 degrees Fahr. We note that the bars low in elongation have a copper color in the center while those specimens which are high in elongation are gray.

The gray fracture you mention is the correct color for the composition you are casting, and the copper color arises from the lack of proper feeding. Correction for that is not an increase in temperature. In fact the temperature you now are using is rather on the high side and indicates the possibility that the metal is being exposed to the furnace gases for an excessive period to obtain superheat.

Absorption of gases gives rise to considerable trouble and will retard the feeding process seriously so that the copper-colored fracture is produced. We believe that you can overcome your trouble by proper gating of the test bar, watching your melting practice, and keeping pouring temperatures within a reasonable range.

Presumably you are using the standard design Navy bar in which the bar is cast to shape with allowance for machining, and is attached along its entire length to a riser by a web at least 3/16-inch thick. The web should be well filleted at its junction to the bar and to the riser. While filleting is indicated in the design, you will get more satisfactory results by increasing the filleting by addition of wax.

Have the metal in the test bar run uphill slightly to eliminate any tendency of the metal to wash back.

Proper Feeding of Test Bars Is Essential To Obtain Results

We have been running into trouble with Navy specification 46B22, grade 2 in that we cannot seem to control the elogation with regularity. An average of ten heats from the same lot of ingot showed 82.80 per cent copper, 8.23 per cent tin, 8.10 per cent lead, 0.45 per cent nickel and 0.41 per cent phosphorus. Tensile strength ranged from 25,500 to 30,000 pounds per square inch which was satisfactory,, but the elongation varied from 4 to 15 per cent, with 8 per cent minimum required. In fact, eight tests ran from 6 to 7.5 per cent. We have tried reducing the lead to 7.25 per cent and increasing the nickel to 0.90 per cent, but that did not help.

The minimum requirement of 8 per cent for 46B22, grade 2 should not be difficult to meet if you are careful to see that the alloy is mixed well, and that temperature control is maintained within reasonable limits. If you were not using ingot, it might be that hot pouring with slow cooling permitted lead segregation. It appears that you are exposing the alloy to an excessive melting period permitting gas absorption, and possibly your gating of the test bar may not be the most satisfactory.

Presumably you are making the regulation test bar prescribed by the government specification. You will find it desirable to cut the gate into the end of the block that feeds the bar. That will insure good feeding since the riser will be last to freeze. Be sure and stir the alloy well so that there is no tendency for most of the lead to remain in the bottom of the crucible. Also it is advisable to perform the chemical analysis on drillings from the test bar so that you may be able to judge more accurately the variations in test bar results.

It is hard to understand why you should have such low elongation, particularly when you are using a *small* percentage of nickel. Phosphorus added to copper-lead alloys tends to result in the concentration of lead at the lower part of the bath, or in castings which cool exceedingly slow.

Cupola Bed Can Be Ignited By Using Long Gas Flame

We shall appreciate information on the equipment and method required to light the coke bed in a cupola.

Lighting the bed coke in a cupola with gas or oil has been practiced to a considerable extent in the foundry for many years. Up to the present so far as we know no figures have been published to show comparison in cost between this method, and the usual method of lighting the coke with wood. The decision to use one method in preference to the other usually is based on personal preference influenced by custom, tradition, former experience and the availability of a constant supply of wood, oil or gas.

Method of applying the gas or oil flame shows many variations. The foundryman may build his own burners, or he can order them from any of the manufacturers who specialize in the manufacture of this type of equipment and whose names and addresses appear in the advertising pages of THE FOUNDRY. These manufacturers are prepared to recommend the most suitable size for any cupola and also are in position to supply figures on the cost of operation. One advantage of the manufactured torches is that in addition to lighting the cupola, they may be used throughout the day in drying ladles and in skin drying molds.

For small cupolas the torch is placed in the open breast and the flame allowed to play on the coke for approximately ½-hour. The time will vary to some extent depending on the size and condition of the coke. In large cupolas two or more small tunnels extending in V-form from the breast carry and spread the flame in the lower strata of coke. Lighting the coke through the breast opening involves making up the breast after the coke is ignited. That practice is not favored by modern cupola men who prefer to make up the breast and tap hole before placing any coke in the cupola irrespective of the method employed in starting the fire.

In the preferred method a hole is cut through the lining and shell just above the sand bed. A hole also is cut through the wind belt in the event the wind belt extends down to the base plate. The burner is inserted in this opening and the flame travels through the two tunnels in the coke as in the first instance. After the coke is ignited the burner is removed and the hole in the lining and shell is plugged with a suitable refractory block or a few bricks and mud. Where an opening appears in the wind belt, a small door is fitted and held in place with a couple of wing nuts. The opening may be at any point, usually at one side midway between the tap hole and slag hole. The coke tunnels may be any convenient size, 4 x 6 inches in a small cupola, up to 6 x 10 inches in a large cupola.

GANGWAY! By J. A. Patterson

"Say, Mendelson, did you ever consider an underarm deodorant?"

Attach Steel Plate To Anvil Face

We shall appreciate information on the method employed to attach a steel plate to the working face of a blacksmith anvil. Our attempts up to the present in doing that type of work have not been successful.

Method of attaching the tool steel plate to the face of a cast iron anvil is based on the same principle as that occasionally employed in foundries for repairing castings and known as *burning on*. The face of the plate is cleaned thoroughly either by sand blasting or pickling and then covered with a thin film of oil or shellac to prevent condensation of moisture and consequent development of a slight scale or oxide film.

The plate is placed in the bottom of the mold and above a cavity almost equal in area to the plate. Metal is poured into this cavity and allowed to stand until the plate becomes red. Length of time depends on size of cavity and size and thickness of plate. Condition of the plate may be noted by looking down through the riser opening in the cope of the mold.

With the plate in suitable heated condition, metal is poured into the mold proper through a gate which spreads a stream of metal over the plate from one end. An exit gate is provided at the opposite end slightly above the level of the plate. Sufficient metal is poured over the plate at this stage to insure a fused joint. No hard and fast rule has been developed for guidance on this phase of the operation. It is one of the shop kinks or trade practices that can be learned only through actual experience. The most essential feature is exceedingly hot metal. When the operator is satisfied that fusion has taken place, the exit gate is plugged and the remainder of the mold is filled in the usual manner.

Suitable Sand for Brass Castings

We manufacture brass and bronze castings for builder's hardware. We use Albany No. 0 sand with addition of molasses and salt which is fairly satisfactory without using any special facing. We would prefer a sand which does not require any addition. Our sand is cut and riddled by hand.

Every foundryman would like to be able to avoid the use of facing in the production of high grade ornamental castings. Degree of accuracy of the ornamental castings in the rough determines how far one may depart from the exacting technique which includes facing, special care and attention to many minor details. A finer grade of Albany sand, No. 00 might be employed. Under normal conditions some foundrymen use French sand, but at present that is not available. In any case the patterns should be faced with sand through a fine sieve and backed up with the ordinary heap sand. Hand cutting and sieving yield satisfactory results if done properly.

Presumably the molds are dried since the facing contains salt and molasses. We are inclined to the opinion that this sand sticks to the pattern and thereby detracts from the accuracy of impression. The pattern should leave a clear, sharp impression in the sand. Well prepared clear sand without salt or molasses properly sifted over the face of the pattern should serve satisfactorily if the face of the mold is covered with a thin layer of soot from an oil or acetylene torch. If this method is not convenient a thin film of flour can be sifted over the face from a bag.

The flour will stick to the green sand face and when the metal enters the mold will burn just sufficiently to produce a thin film of gas which allows the metal to rest quietly and smoothly and does not burn into the sand. One helpful step in the preparation of the sand is to roll or mull it. This action tends to force each grain to have its share of the bonding material. However, after the sand is mulled it should be passed through a mechanical aerator, or riddled several times. This treatment will produce a free venting sand, with bond properly distributed to insure a mold that will stand up in service and reproduce the ornamentation on the pattern.

Silicon Is Present As Iron Compound

Can you tell us in what form silicon exists in ordinary foundry iron; that is does it exist as free silicon or is it combined with carbon, etc.? We are asking because of analytical requirements in its determination as a well known book describing the determination of graphite says to dissolve 2 grams of drillings in 100 milliliters of 1.1 specific gravity hydrochloric acid or 1.135 specific gravity nitric acid and boil gently until action ceases. Keep the beaker covered to prevent evaporation and concentration of the solution *which may cause a separation of the silica.*

Silicon is not found in the free state in iron and steel, but exists as a compound of iron and silicon. Since the iron also forms compounds with carbon, the three elements iron, silicon and carbon may be present as a ternary compound such as silico-pearlite, etc. However, as we see it, the problem is not so much one of what the original form of the silicon is, but one of insuring a precipitate of graphite uncontaminated with other materials.

Ordinarily after the iron is dissolved in acid, the silicon remains in solution as silicic acid. However, concentration of the liquid through evaporation may lead to partial dehydration of silicic acid to form a gelatinous form of silica which is extremely hard to filter since it clogs the pores of the filtering medium. Hence, it is best to avoid that condition by maintaining the original bulk of the solution, and addition of a small amount of hydrofluoric acid as directed in the description you are following.

Solid Slugs Porous In the Center

We are having trouble with solid cast iron bushings 6 inches diameter and 18 inches in length, cast on end with a side gate at the top and a 4-inch diameter riser 5 inches high. We make the castings 24 inches in length to insure a solid casting, but when the extra 6-inch piece is cut off we find a porous spot in the center of the cut end. We have tried feeding some of the castings with a rod, but without effect. The cupola charge is made up of 100 pounds steel scrap; 200 pounds pig iron; 700 pounds machinery scrap with 2 pounds manganese and ½-pound silicon in briquet form. Pig iron analysis is: Silicon 3.00 per cent, phosphorus 0.20-0.30 per cent, sulphur 0.03 per cent, manganese 1.00 per cent.

Since porosity in the center apparently is a cause for rejection, we assume that the castings are solid slugs instead of bushings as stated. If the castings in the finished form are to be solid cylinders, several methods are available to produce solid homogeneous castings. The method to some extent will depend on whether the casting is to be used as a unit, or is to be cut into a number of disks. In the first instance the simplest and cheapest method is to place what is known in the foundry as a *dutchman* upright in the center of the mold.

This cylindrical piece of iron will cool the iron rapidly in the vicinity and prevent shrinkage. It can be held in place with a nail cast in top and bottom, by a core print top and bottom, or in any other convenient manner. For a 6-inch diameter casting the *dutchman* may be approximately 3 inches diameter. Obviously it must be perfectly dry and perfectly clean to prevent the molten iron from kicking. No riser or extra head metal is required. This method also may be used where the casting in whole, or cut into disks, is to be bored out in the center.

Where the casting is to be cut into disks which have to be solid, a different method is employed. The pattern is made 1 inch longer than the anticipated casting to allow for shrinkage and machining. The mold is made in the usual manner and the metal is poured slowly through an ordinary small gate at the side of the top. Place and position of the gate are not factors of importance.

(*Concluded on page* 94)

IT'LL TAKE PLENTY OF *Scrap* TO WIN THIS FIGHT!

3 Million Tons of iron and steel scrap are wanted every month . . . Are you doing your part to help America win her battle of production?

CONSERVATION AUTHORITIES RECOMMEND THESE 8 STEPS TO GET IN THE SCRAP

1 Put some one individual in charge of scrap in all departments of your business and GIVE HIM AUTHORITY TO ACT.

2 Comb the plant and yards for dormant scrap, abandoned equipment, old boilers, pipe, moulds, obsolete dies and parts, material now being destroyed which has salvage value.

3 Survey all plant equipment, particularly idle standby or discarded machines, with a view to applying or converting them to useful production.

4 SEGREGATION:
Identify, classify and segregate scrap and supervise its handling to avoid contamination. This will increase its value.

Provide separate containers, clearly marked, for each class of scrap material.

Repair or rework worn or broken cutting tools Keep unusable small pieces and turnings segregated. Even high speed steel grinding dust is valuable.

Dismantle discarded equipment promptly into its components—electrical, fastenings, lumber, etc.—so that these parts may be utilized or scrapped.

Sort blanks, short ends, cut-downs, clippings, etc., for possible reuse for smaller parts made in the same or other departments.

Recover and reclaim used cutting oils, lubricants, surplus paints and spray finishes.

Sort sweepings and miscellaneous waste to recover scrap values.

5 Constant reminders in the form of posters, illustrations of right and wrong methods, pay envelope enclosures, house organ publicity, etc., are potent aids to the conservation program.

6 Release for scrap, obsolete engravings, electrotypes, and standing types for catalogs, forms and advertising material.

7 Inspect all refuse to detect avoidable waste and excessive rejections. Educate production executives to correct such conditions at the source.

8 For information and assistance on special phases of conservation and salvage communicate with Industrial Salvage Section, Conservation Division, War Production Board, 9th Floor, Washington Gas Light Building, Washington, D. C., or with nearest regional office

The metallurgical experience of our technical staff is available to aid you in these and other technical phases of metal salvage.

KEEP SCRAP MOVING INTO WAR PRODUCTION!

THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK, N. Y.

(*Concluded from page 92*)

Instead of the usual cope, the top of the mold is covered with a dry sand basin core large enough to hold a sufficient quantity of feeding iron, in the present instance 10 inches diameter and 6 inches deep.

The hemispherical basin terminates in an almost feather edge at the bottom where it rests over the top of the mold. A 1-inch hole in the center forms the connection between feeder and casting. Pouring in the gate stops when the metal reaches the bottom of the core. The basin then is filled with hot iron direct from the cupola spout. The upper surface is covered with charcoal, blacking, or silocel and requires no further attention. When the casting is shaken out, the feeding basin is removed readily.

Holes in Bushings Caused by Gas

We are making 80-10-10 bushings and billets and after the castings are machined, blow holes or gas holes show up in the bore and on the outside. Our procedure is to use a good strong core with a well vented mold and pour at about 1950 degrees Fahr. We have poured from the bottom with adequate risers, vertically and horizontally with the same results.

The 80-10-10 alloy is one of the simplest to cast, but unfortunately it also is one of the easiest to gas during melting. Hence, your melting procedure must be watched carefully to eliminate that trouble. While it is possible that your cores may be a little too hard, it is our opinion that gas absorption is the cause of your difficulty.

Your pouring temperature is about right, and the description of the well vented mold suggests good molding practice. Pouring the castings vertically or horizontally would not particularly influence the condition from gassed metal, except that the highest part of the casting presumably would have the larger number of holes since the gases float toward the top—all other conditions being equal.

If you are using solid-fuel pit furnaces investigate the condition of the flues. See that they are open and not clogged with ashes or broken flue linings. Also see that the grates are open to supply plenty of air. with gas or oil-fired furnaces see that the burners are adjusted to give complete combustion. Preferably use a sharp flame as opposed to a soft, yellow flame. Melt the metal as rapidly as possible, and do not hold it in the furnace any longer than necessary after it has reached the proper temperature. Also see that cold metal or ingot as charged into the crucible does not extend above the top. If it does, use a section of a crucible to extend the height.

Wants Information On Cost System

The cost system which served satisfactorily for many years in our nonferrous foundry, is not adequate to meet requirements under present conditions. We shall appreciate your kindness in sending us several systems from which we can make a selection.

THE FOUNDRY on many occasions has published articles on foundry cost keeping methods. Papers on the same subject have been presented before chapter meetings and annual conventions of the American Foundrymen's Association. These papers have been incorporated in the *Transactions* of the association. Written before the present emergency, specific directions for adapting the system to the overwhelming mass of regulations, priorities, allocations, price ceilings, etc., are not included.

Following the presentation of a set of papers at the 1937 Milwaukee convention, the American Foundrymen's Association, prepared a booklet on the subject of cost methods in the four main branches of the foundry industry, gray iron, malleable iron, steel and nonferrous. This little book for which a nominal price of $1.00 is charged, might give you a foundation on which to build your own system. Practically every foundry has to develop a system adapted to meet its own peculiar conditions. A local accountant might be in position to set up a suitable system. Alternatively you might submit your problem to any one of a number of foundry cost consultants who specialize in this phase of the foundry industry.

Core for Heavy Bronze Casting

We are making 1500-pound bronze valve castings with heavy flanges and heavy and light sections. The bronze contains a little phosphorus. We shall appreciate the formula for a core sand mixture and a core wash that will serve satisfactorily and can be removed readily from the casting.

High permeability and high refractoriness are the principal features in a satisfactory core for these heavy bronze castings in which a small amount of phosphorus increases the fluidity and consequent ability of the metal to penetrate between the sand grains on the face of the core. In addition to the high temperature, the natural contraction of the casting has a tendency to force the metal into more intimate contact with the core. Under the conditions prevailing at present, your best course of action is to adopt a leaf from the steel foundryman's book of practice.

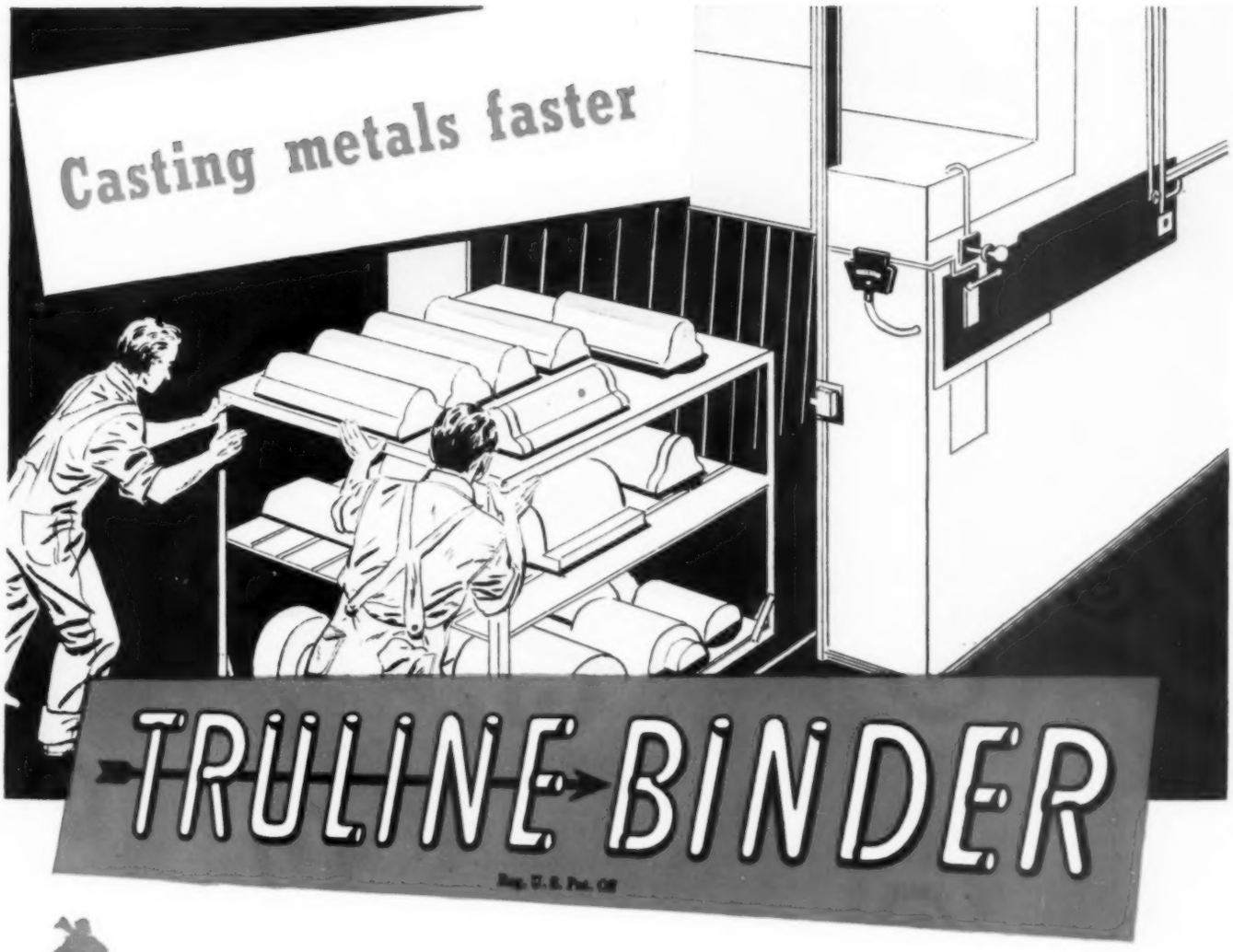
Make a silica sand core and paint it with silica wash. A typical core sand mixture for steel bomb castings shows 1350 pounds silica sand, 250 pounds silica flour, 4 gallons core oil No. 1, 4 gallons core oil No. 2, 7 gallons water. This gives a moisture content of 4 per cent, permeability 35, green compression 5 pounds, deformation 35. The material is mixed in a muller for 1 minute while still dry, water is added over a 1 minute period, then the batch is mixed for 2½ minutes. The oil is added slowly and the batch is mixed for an additional 2 minutes. Cores are baked at 420 degrees Fahr. for approximately 4 hours, with additional 1½ hours cooling time. The burned sand runs readily from the casting and leaves a smooth interior.

Metal Should Show Higher Tensile

We are making gray iron castings 8 inches diameter, 16 inches in length, from a mixture containing 300 pounds pig iron, 200 pounds scrap, 500 pounds steel rails, 5 pounds silicon and 4 pounds manganese in briquet form. This iron shows an analysis of: Silicon 1.55 per cent, manganese 0.95 per cent, phosphorus 0.21 per cent, sulphur 0.11 per cent, graphitic carbon 2.70 per cent, combined carbon 0.61 per cent. Specifications call for 30,000 tensile strength, but the highest we can get on our bars is 29,800 pounds per square inch.

Iron of the analysis indicated should show a tensile strength of 30,000 pounds per square inch, or higher. We are inclined to the opinion that either the test bar was slightly defective or was not held properly in the grips. Preferably the test bar should be poured vertically in a dry sand mold. The greatest care should be taken to see that the bar is gripped properly at both ends to insure a true perpendicular pull. Your total and graphitic carbon are higher than one might expect from a charge containing 50 per cent steel. Possibly you are holding the metal in contact with the coke in the cupola for a longer period than necessary. Minor improvements might include reduction of the manganese to 0.75 per cent and reduction of the sulphur to 0.08 per cent by the use of soda ash in the ladle. Substitution of an additional 100 pounds of steel for 100 pounds of cast iron scrap will raise the tensile strength to some extent.

It may be well worth your time to investigate the test bar you are making and see that it is poured at the proper temperature, and gated in the best manner to insure the highest physical properties. Since acceptance or rejection of the castings may be based on results obtained from the bars, common sense will dictate that considerable care should be devoted to their manufacture—just as much in fact as is taken in producing the castings. A little time spent on seeing that the test bar is made properly will pay dividends.



Foundries throughout the country are demonstrating every day that Truline Binder speeds work in the core room and on the cleaning floor.

Where conditions are right, which they usually are, core-oven output is sharply increased with Truline, sometimes even doubled.

Moreover, costs are usually reduced. Time is saved in cleaning castings, because the cores burn out so completely and so fast. There are apt to be fewer rejects—more sound, smooth castings.

With the present need for speed in production, you should find out whether Truline will help you as it is helping so many others.

Clip the coupon to your letterhead and mail today.

NAVAL STORES DEPARTMENT

HERCULES POWDER COMPANY

INCORPORATED

999 MARKET STREET · WILMINGTON, DELAWARE

Please send ☐ sample ☐ information on how to use Truline Binder in casting: .....
(state type of work and kind of metal cast)

.....

Name _____

Company _____ *Title* _____

Address _____ *City* _____ *State* _____

men of industry

Carl H. Morken, general superintendent of the Carondelet Foundry Co., St. Louis, has been appointed technical consultant on the staff of Brig. Gen. Barnes, assistant chief of ordnance, research and engineering, War Department. Mr. Morken is to assist the several departments of ordnance in the program of conservation of critical materials and to assist in the application of gray and malleable iron where possible.

♦ ♦ ♦

Lowell L. Henkel, for the past 8 years research engineer, metallurgist and chemist, Interlake Iron Corp., Chicago, now is administrative aid, Technical Development Section, Production Branch, War Production Board, Chicago. Mr. Henkel is immediate past chairman, Chicago Chapter of the A.F.A.

♦ ♦ ♦

H. K. Clark, vice president and general manager, Norton Co., Worcester, Mass., who recently returned to Worcester after 9 months' service as a member of the OPM and WPB, has returned to Washington. He has been appointed a lieutenant commander in the Navy and has been assigned to the Army and Navy Munitions Board.

♦ ♦ ♦

Clifford O. Richards, formerly assistant purchasing agent, has been appointed purchasing agent, Taylor-Wharton Iron & Steel Co., New York, to succeed **R. C. Schaeffer,** resigned. Prior to joining Taylor-Wharton in January, 1941, Mr. Richards was with the Fitz Chemical Co., subsidiary of the J. T. Baker Chemical Co. Mr. Richards' office will be at the Taylor-Wharton plant in Easton, Pa.

♦ ♦ ♦

E. I. Valyi has become associated with Lucius Pitkin Inc., New York.

♦ ♦ ♦

Hans R. Stephan has been appointed assistant metallurgist, Allis-Chalmers Mfg. Co., Milwaukee.

♦ ♦ ♦

Bertrand S. Norris has joined the York Ice Machinery Corp., York, Pa., and is serving as metallurgist in the research laboratory.

♦ ♦ ♦

Roy F. Kruck recently has been appointed assistant to the general superintendent, Superior Steel & Malleable Casting Co., Benton Harbor, Mich.

♦ ♦ ♦

Frank E. Wartgow, production engineer, American Steel Foundries, East Chicago, Ind., recently was elected secretary, Chicago Chapter of the A.F.A.

♦ ♦ ♦

Robert L. Warfel has been appointed a research engineer on the staff of Battelle Memorial Institute, Columbus, O., and has been assigned to the division of analytical chemistry. Prior to joining the Battelle staff, Mr. Warfel was associated with Carnegie-Illinois Steel Corp., Gary, Ind. He received his technical training at Ohio State University.

♦ ♦ ♦

H. W. Anderson has been made vice president, Aviation Division and **M. J. Rice,** vice president, Quickwork-Whiting Division, Whiting Corp., Harvey, Ill.

♦ ♦ ♦

Edward L. Horne, formerly on the laboratory staff of Duriron Co., Dayton, O., now is serving as materials engineer, U. S. Army Corps Materiel Center, Wright Field, Dayton, O.

♦ ♦ ♦

Maurice G. Jewett, formerly chief metallurgist and chief engineer, Chain Division, Chain Belt Co., Milwaukee, has been commissioned a lieutenant colonel in the Army.

♦ ♦ ♦

Elmer W. Silver, secretary, Whitehead Metal Products Co. Inc., has been elected treasurer to succeed **William L. Rianhard,** who died recently. Mr. Silver also will continue to serve as secretary.

♦ ♦ ♦

Ray T. Patton has been appointed district manager in charge of the newly opened Cincinnati office of the Republic Coal & Coke Co. The office is located in the Union Trust Building, Cincinnati.

♦ ♦ ♦

H. S. Landon has been appointed general manager of sales, Ohio Ferro-Alloys Corp., Canton, O. Mr. Landon has been Chicago and Western district sales manager of the Ohio Ferro-Alloys Corp. for

(*Concluded on page* 98)

Carl H. Morken

Lowell L. Henkel

H. K. Clark

Clifford O. Richards

Woodward

•••—

Uniform

PIG IRON

WOODWARD IRON COMPANY

WOODWARD, ALABAMA

America's Largest Completely Integrated and Entirely Independent Merchant Iron Producer

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ☆ ★ ☆ ☆ ★ ★ ★

(*Continued from page* 96)

the past 8 years. **B. A. Patch,** who has been in that territory for a number of years in connection with pig iron, alloys and fluorspar sales, has been placed in charge of the Chicago district office at 1740 Conway Building.

♦ ♦ ♦

Douglas B. Rader has been appointed director of advertising, Lindberg Engineering Co., Chicago. Mr. Rader succeeds **R. C. Onan** who recently was made district sales manager with headquarters in Milwaukee. **Robert S. Aitchison** has been appointed sales promotion manager.

♦ ♦ ♦

Frank E. Hutchinson, vice president and general manager, Reliance Foundry Co., Cincinnati, has been elected chairman of the Cincinnati District Chapter of the A.F.A. Mr. Hutchinson joined the Reliance Foundry Co. as office manager in July, 1929 and was elected to the board of directors as secretary-treasurer of the company in September, 1929. He has served as vice president and general manager since May, 1937. Mr. Hutchinson is a charter member of the Cincinnati Chapter and was elected to its board of directors in 1939. He served as vice chairman last year.

Frank E. Hutchinson

♦ ♦ ♦

Leonard J. Wahler, assistant chief engineer, Western Foundry Co., Chicago, has been appointed chief engineer, succeeding **E. J. Brady,** who resigned Aug. 1. Mr. Wahler was connected for 20 years with the former Stover Mfg. & Engine Co., Freeport, Ill., serving as foundry superintendent for the last 7 years prior to joining the Western Foundry Co.

♦ ♦ ♦

Carl L. Halpin, formerly assistant manager, Packard Motor Car Co., Detroit, has been appointed chief engineer, Bass Foundry & Machine Division, National Industries Inc., Ft. Wayne, Ind. Included on the production engineering staff of the company are: **William J. Barth,** formerly chief inspector, Crucible Steel Casting Co., Cleveland; **John W. Ferris,** formerly with the Lampman Mfg. Co., Huntington, Ind.; **Wilmore F. Chaney,** formerly superintendent of electric melting furnaces, Crucible Steel Castings Co., Cleveland; **Howard B. Shank,** formerly general foreman Lima Locomotive Works; **Shirley M. Smith,** formerly connected with the General Electric Co., Ft. Wayne; and **Clarence Stum,** formerly with Doall Toledo sales and service department, Toledo, O.

♦ ♦ ♦

F. Ward Coburn has been elected president of both E. & G. Brooke Iron Co., Birdsboro, Pa., and Richord Ore Co., Wharton, N. J. Mr. Coburn, formerly vice president of those organizations, succeeds the late Robert E. Brooke, former president of the companies.

♦ ♦ ♦

Paul H. Shaeffer, formerly assistant general manager, Ohio Ferro Alloys Corp., Canton, O., has been appointed to a similar position with the Pittsburgh Metallurgical Co., Niagara Falls, N. Y., and Charleston, S. C. Mr. Shaeffer will have his headquarters at the company's general offices in Niagara Falls.

♦ ♦ ♦

William R. Odell Jr., assistant treasurer, International Harvester Co., Chicago, has been appointed assistant to **James F. Oates Jr.,** head of the contract service division, Chicago Ordnance District, to aid in the work of price adjustment. This includes review of all ordnance contracts awarded to date to determine whether profits have been excessive.

♦ ♦ ♦

Joseph B. Meier recently has been placed in charge of the nonferous foundry section of the Office of Price Administration, succeeding **T. F. McManus,** who was transferred to the ingot and scrap section of the copper, aluminum and ferro alloys branch. The section falls under the over-all supervision of **O. S. McCorison,** who formerly headed the mill products section but now has charge of the combined mill and nonferrous foundry section.

♦ ♦ ♦

Samuel R. Robinson, for the past 8 years foundry metallurgist, Otis Steel Co., Cleveland, resigned recently to accept a position as works manager Valley Steel Castings Co., Bay City, Mich. Following graduation with a degree in chemical and metallurgical engineering from Virginia Polytechnic Institute, Mr. Robinson entered the steel casting industry as chemist and tropenas converter blower at the plant of the Massachusetts Steel Casting Co., Everett, Mass. Later he was steel blower and metallurgist for the Duquesne Steel Foundry Co., Coraopolis, Pa., for 11 years. He served as foundry manager for Industrial Brown Hoist, Corp., Bay City, Mich., for 8 years. In 1934 he joined the Otis Steel Co., Cleveland as foundry metallurgist.

♦ ♦ ♦

Commander R. E. W. Harrison, after serving a little more than 2 years as staff officer in the offices of the assistant and under secretaries of the United States Navy, has been released from active duty to devote his efforts to the provision of basic tools required to produce airplanes. While on duty in Washington, he was assigned the task of providing machine tools required at the United States Navy yards, naval bases and other establishments. Upon entering active service in the Navy, Commander Harrison resigned as vice president, Chambersburg Engineering Co., Chambersburg, Pa., and Clarke-Harrison Inc., Philadelphia. He now resumes his duties as vice president of both the companies.

Commander R. E. W. Harrison

♦ ♦ ♦

Edward J. Brady Sr., recently resigned as chief engineer, Western Foundry Co., Chicago, to become engineer, Alloy Rods Co., York, Pa. Mr. Brady's son, E. J. Brady, is president and general manager of the latter company which manufactures coated welding rods.

♦ ♦ ♦

W. H. Cameron, managing director, National Safety Council, Chicago, has retired after serving 30 years in that capacity. He is succeded by **Ned. H. Dearborn,** dean of the division of general education, New York University, New York, since 1934. Mr. Cameron is known as the father of the safety movement. Employed by the American Steel Foundries in 1913, he suggested to the management the idea of watching out for the safety of the men in the company's 11 foundries. The management immediately put the

(*Concluded on page* 100)

Information supplied by "The Foundry"

The nation-wide drive for the collection and utilization of scrap metal is one in which the foundries of the country can function not only as receivers, but also as suppliers.

Many foundries are doing just that and finding tons of usable scrap right on their own premises. They are making a systematic effort to locate all worn out equipment such as machines, flasks, etc.—reclaiming cast scrap for their own charges and selling to dealers such material as is not usable in the foundry.

Aside from the patriotic and economic angles, good housekeeping alone is worth the effort of scrap location and utilization. It makes for orderliness in and around the foundry, which speeds production, reduces lost time and greatly increases safety.

One enterprising foundry is going even farther. It is using its yard for automobile wrecking, sending suitable scrap to its own furnaces and selling the body scrap to steel mills. Thus, this foundry is both saving its own scrap situation and assuring itself a supply of excellent scrap for the production of high type castings.

CLIMAX FURNISHES AUTHORITATIVE ENGINEERING DATA ON MOLYBDENUM APPLICATIONS.
MOLYBDIC OXIDE—BRIQUETTES FOR THE CUPOLA • FERROMOLYBDENUM FOR THE LADLE

Climax Molybdenum Company
500 Fifth Avenue • New York City

MOLY

(*Concluded from page* 98)

idea in effect. The following year several other manufacturers held a meeting in Chicago to form a safety organization. Mr. Cameron was elected the first director and was given a fund of $1500 to work with. That was the beginning of the National Safety Council which now spends an average of $1,000,000 a year on safety education.

• • •

Brig. Gen. Thomas S. Hammond, Illinois National Guard, retired, and former president, Whiting Corp., Harvey, Ill., has been appointed chief of the Chicago Ordnance District, to succeed **Brig. Gen. Donald Armstrong,** who has been made chief of the army's new combat automotive center, Detroit. Gen. Hammond has been connected with the ordnance office since Jan. 21, when he resigned as president and general manager of the Whiting Corp. to become the district's production advisor. He became chief of the production service May 16, and on July 21 was appointed deputy district chief. Gen. Armstrong has headed the Chicago Ordnance District since July, 1939. Gen. Hammond has been active for many years in United States military service.

Gray Iron Founders' Society To Meet

Annual meeting of the Gray Iron Founders' Society will be held at the Hotel Cleveland, Cleveland, on October 9. All gray iron foundry executives are invited to attend the one day session which will emphasize a program designed to feature the war problems of the gray iron foundry industry.

The program will include a discussion of pig iron allocation by William Kerber of the WPB, a talk by D. K. Kennedy of the OPA on price freezing of castings, a discussion of material substitutes in the foundry field by Don J. Reese of the WPB, and consideration of the scrap problem by a representative of the scrap division of the OPA. E. L. Shaner, president, Penton Publishing Co., Cleveland, will be the speaker at a complimentary luncheon and will discuss the general situation as it regards the iron and steel industry.

The government officials who will appear on the program are men actually handling the problems in the foundry industry in the several war agencies and will be in a position to answer questions of prime importance at the present time. This year the annual meeting of the society will provide a common meeting ground for government and industry to discuss their mutual problems.

A. C. Denison, president, Fulton Foundry & Machine Co., Cleveland, is president of the society, and W. W. Rose is executive vice president. The society maintains offices in Washington and Cleveland.

Convert Iron Shops To Magnesium

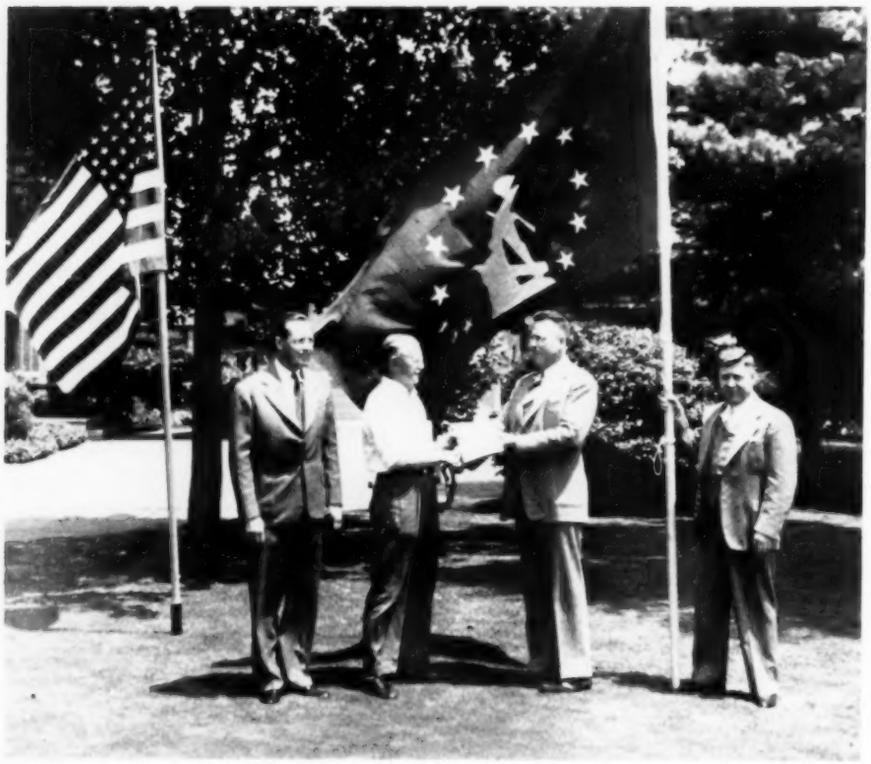
Blake Ozias, Office of Information, War Production Board, recently announced in a talk before a Chicago group that a number of gray iron foundries throughout the country are being converted to the production of magnesium castings for war purposes at a considerable saving in time and money. Mr. Ozias said in part:

In Washington, we have the Plant Site Board which must approve or decline to approve any new construction project, and as these projects come before the board, careful consideration is given as to whether or not existing buildings and machinery may be made use of and thus make the new project unnecessary. There are many examples of this but a typical one was in the case of the needed expansion of facilities for making magnesium castings. One project alone, which was put forward in this connection, called for a magnesium casting foundry which would have cost the Government 14 million dollars. When this project came before the Plant Site Board, a suggestion was made that these facilities might be found in the gray iron foundry field. Studies were made and today some 20 or more gray iron foundries, which otherwise would be almost completely without work, are being converted so that they can produce magnesium castings. In this way, large amounts of construction materials have been saved as well as time and labor. It is estimated that this vitally needed magnesium casting capacity will be provided by this means 50 *per cent sooner*, and that *two-thirds of the cost will be saved*. We shall have these magnesium castings in four or five months instead of in nine or ten months.

This solution of the magnesium castings problem was made possible by the Facilities Utilization Division, a group of engineers and technical experts under the direction of W. B. Murphy.

As yet the complete list of foundries undertaking such conversion projects has not been made available.

Awarded Flag for War Bond Purchases



The Foxboro Co., Foxboro, Mass., was awarded the Minute Man flag of the Treasury Department July 8, in recognition of payroll allotment subscriptions by more than 95 per cent of its employes. Alfred C. Sheehy, deputy state administrator, War Savings Staff for Massachusetts presented the Minute Man flag and certificate to Irving W. Lane, veteran employe of the Foxboro company

Col. R. H. Morse, president and general manager, Fairbanks, Morse & Co., Chicago, has contributed funds for construction of a hospital and nurses training school in Beloit, Wis., by the John Morse Memorial Foundation established in memory of his son John Morse who lost his life in an automobile accident in San Rafael, Calif., Aug. 22, 1941.

The CORE OIL DOCTOR

Devoted to new ideas and case study reports on core room practice

Published Monthly, Volume 1, Number 6, September 1942

Can We Help You?

There is a *correct grade of core oil* to meet the particular conditions of every foundry, to produce cores most economically, reduce core losses to a minimum and speed up core production by smoother working in the boxes. Additionally, proper core oil should provide for less crusting on the bench during the hot weather when mixed with sand, speedy drying in the oven, easy shake-out, minimum cleaning cost and reduced gas created in the mold when the metal is poured. We can furnish you with the *correct grade of core oil* to produce the results stated as we are doing for foundries in every state of the union.

Tell us in plain foundry language what core production difficulties you are having and send us a 4 ounce sample of your present oil, also 5 pounds of the core sand you use, oven heat employed, oil to sand ratio and if any other binder is employed. We will make tests in our own laboratory with our oil to eliminate your troubles, and furnish a detailed report of our findings. If no sample of sand is sent with the oil, we will use 50 mesh washed silica in our test.

Samples gladly furnished free of charge upon request. We have always shipped "Certified" oil with the understanding that the quality must be as represented, run strictly uniform and give complete satisfaction or be returned for full credit.

Questions and Answers

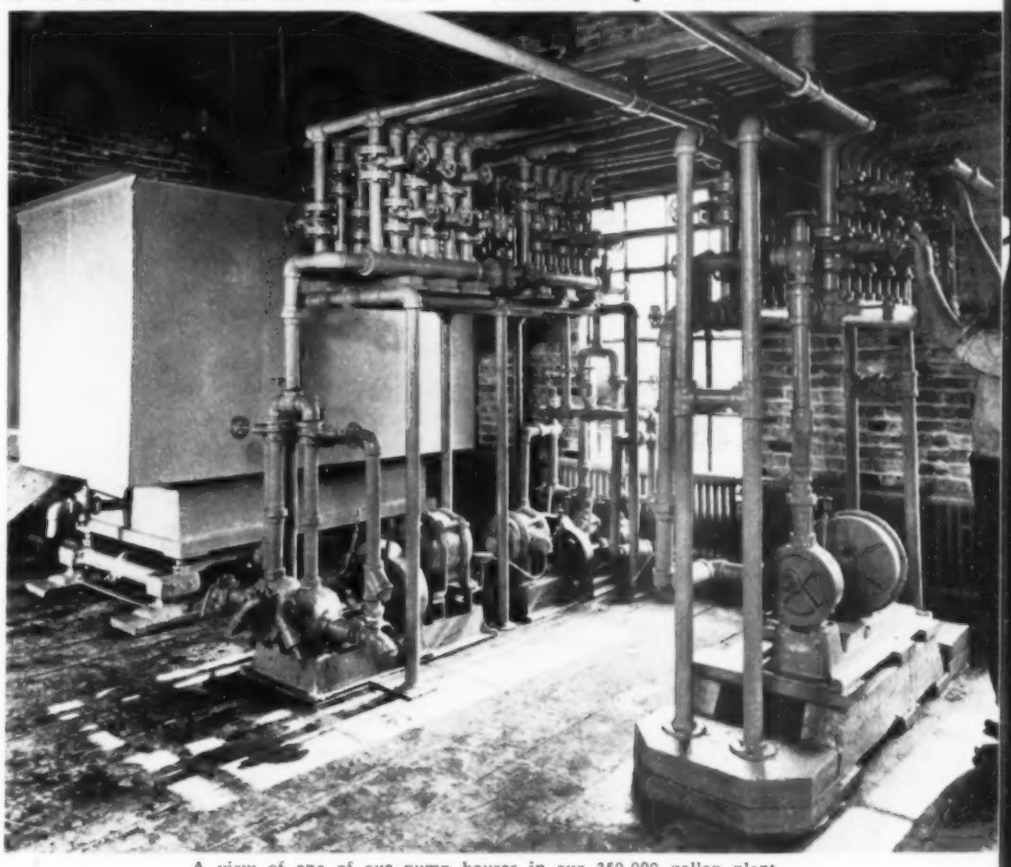
Question: Can you tell us how to eliminate the trouble we have been having during the recent hot spell with cores sticking in the boxes?

Answer: The trouble you are having is common to hot weather operation and, believing others are interested in the suggested cure, we give you our answer here.

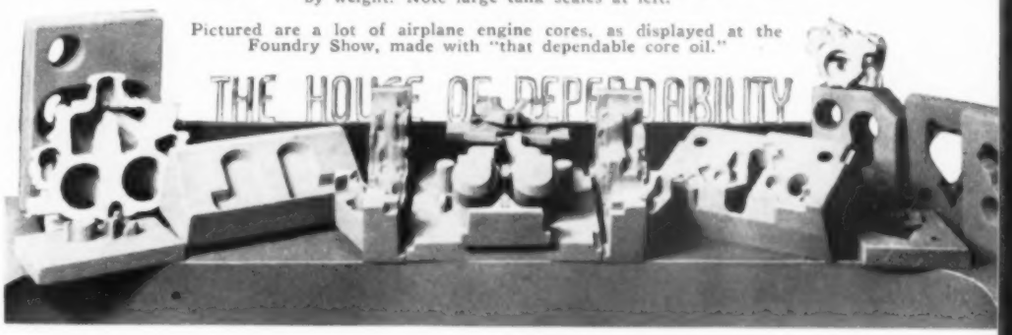
It is a well known fact that some core mixtures will not work smoothly in the boxes during hot weather and, while some core oils do cause considerable trouble and should be replaced with a more suitable oil, there also are other causes for sticking, such as the use of too much cereal binder, too much water or an abundance of "fines" in your core sand.

We suggest you carefully check all these common causes of sticking and continue the practice of cleaning your core boxes with compressed air, dusting with parting and/or apply a very thin coating of kerosene with a brush. Be sure that your air is clean and dry. A simple test is to blow air from the line on a chrome-plated surface or looking glass. If flecks of oil, water or dirt appear on the surface, have a suitable air cleaner installed in your air line.

If the trouble still persists on intricate or deep pocket cores, substitute for the kerosene coating a mixture of 50% paraffin and 50% kerosene, or use all paraffin if necessary. Be sure that only a very thin application is given to the core box; otherwise the edges of the cores will be substantially weakened.



A view of one of our pump houses in our 350,000 gallon plant. Every gallon of Certified Core Oil is bought, sold and processed by weight. Note large tank scales at left.



Pictured are a lot of airplane engine cores, as displayed at the Foundry Show, made with "that dependable core oil."

CERTIFIED CORE OIL & MFG. CO.

"The House of Dependability"

3308-26 South Cicero Avenue, Cicero, Illinois

Stock and Representatives: Buffalo, N. Y. Elmira, N. Y. Worcester, Mass. Reading, Pa. Newark, N. J. St. Louis, Mo. New Orleans, La. Houston, Tex. Chattanooga, Tenn. Minneapolis, Minn.

Foundry Developments at short range

A CANADIAN firm has developed a tin-free bronze which is claimed to possess desirable structural and bearing properties to qualify it for use in worm gears. It is a copper-nickel-antimony alloy and investigations indicate that 2 per cent nickel is the most desirable content. As yet the antimony content has not been established, but an alloy containing 2 per cent nickel, 8 per cent antimony and 90 per cent copper shows good strength and bearing properties. It is said that the composition is not patented or copyrighted, and any good foundry is welcome to use it.

* * *

Ferrous castings except those of the stainless type which must be chemically clean for applying various finishes such as enameling, plating, galvanizing and tinning sometimes cause trouble in that it is often difficult to determine that condition by visual observation. A simple way of making sure that the castings are clean is to use a solution of acidified copper sulphate composed of a saturated solution of copper sulphate to which a slight amount of 2 per cent sulphuric acid is added. The solution may be used as a dip or swabbed on the casting which if clean is coated with bright copper. Presence of sand, iron oxide or foreign material is indicated by the original color not being changed, or a slight blackening.

* * *

MOISTURE in heat treating furnace atmospheres now can be measured to as little as 0.004 per cent through use of an electronic tube resembling those in an ordinary radio set. It is accurate to within 1 degree of temperature and is automatic. In operation gas from the furnace flows through the electronic tube, and as long as dry gas passes, electrons travel steadily from the tube's hot filament to a metal plate, producing an unvarying electric current in an external wire circuit. However, when water vapor is present in the gas, some of the electrons are diverted reducing the electric current. Measurement of the current flow indicates the amount of moisture present.

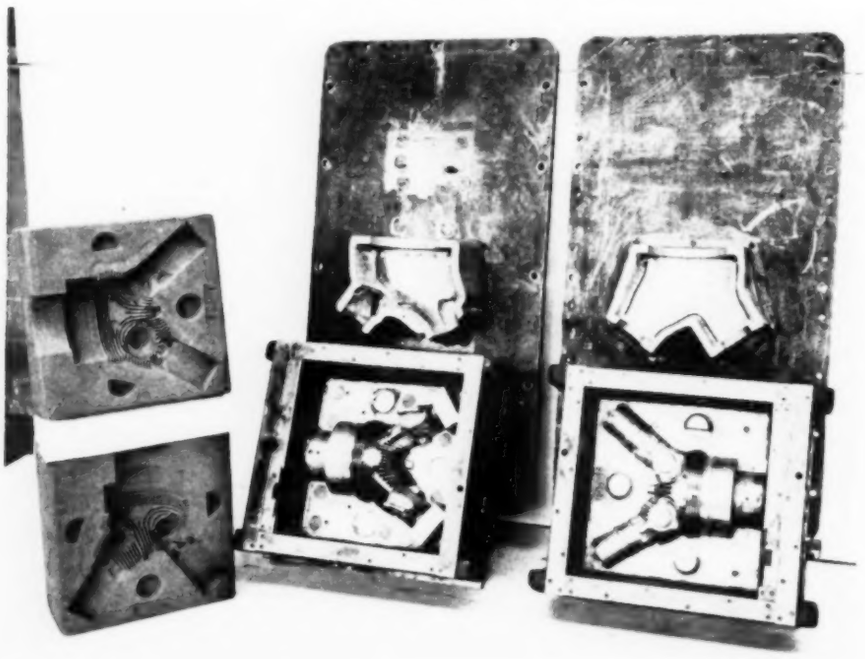
* * *

An idea proposed in a recent patent eliminates considerable machining on the steel barrels used in airplane engines. The procedure is to use a steel tube or barrel of the desired thickness to which preformed fins are attached by casting a thin layer of metal between the two. As described the barrel is coated with zinc or a zinc alloy at around 550 degrees Fahr. The coated barrel is placed in a mold containing the preformed fins made preferably of aluminum, and the whole heated to a temperature from 1000 to 1060 degrees Fahr. Then molten aluminum is poured in the narrow space between the barrel and the fins which bonds the two together to form an integral piece.

* * *

PRODUCTION of finned airplane cylinder heads is not the easiest job in the world with the thin, deep fins, and comparatively thick-walled body which constitute abrupt changes in section, and radically different cooling conditions during solidification. To provide uniform cooling which is claimed to eliminate cracks and checks in the interior surface of the heavier body of the cylinder head which form the combustion chamber, a recent patent describes a procedure which gives results desired. The exterior of the casting is formed in a sand mold while the interior is comprised of a hollow metal body through which heating or cooling fluid may be conducted. Suggestetd method of use is to preheat by flowing through a heating liquid; pour the metal into the mold cavity, and then force cooling liquid through the body.

Caterpillar Tractor Co., Peoria, Ill., has been experimenting with the problem of making cylinder head cores by the blowing method. The illustration shows equipment which is being used in the development work by that method. Photograph courtesy M. J. Gregory, Caterpillar Tractor Co.



This "DRUM" keeps time with accelerated ammunition production

Cast Everdur Copper-Silicon Alloy drum for pickling brass cartridge components with plain, dilute, hot sulphuric acid.

It's of cast Everdur...strong...corrosion-resistant...economical; it helps pickle and clean brass cartridge components

Production of Everdur* for such war-vital use as this pickling drum, has been vastly increased; its value for this and many other types of service is widely recognized . . . Everdur is a high strength, corrosion-resistant engineering metal—furnished in four standard copper-silicon alloys which lend themselves to fabrication by all usual methods, including welding.

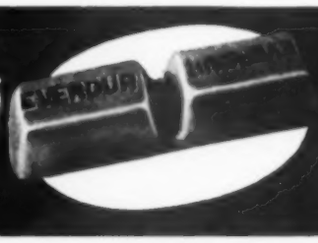
The casting alloy, Everdur 1000, is supplied in 25 lb. notched ingots, and is handled efficiently and economically with regular brass and bronze foundry equipment. Everdur 1000 is a high copper alloy held to definite specification, of which the following is the nominal composition:

COPPER	94.90%
SILICON	4.00%
MANGANESE	1.10%

Our publication E-1, "Everdur Casting Ingots", contains a detailed description of physical properties and foundry practice. Copies free on request. 43109

ANACONDA

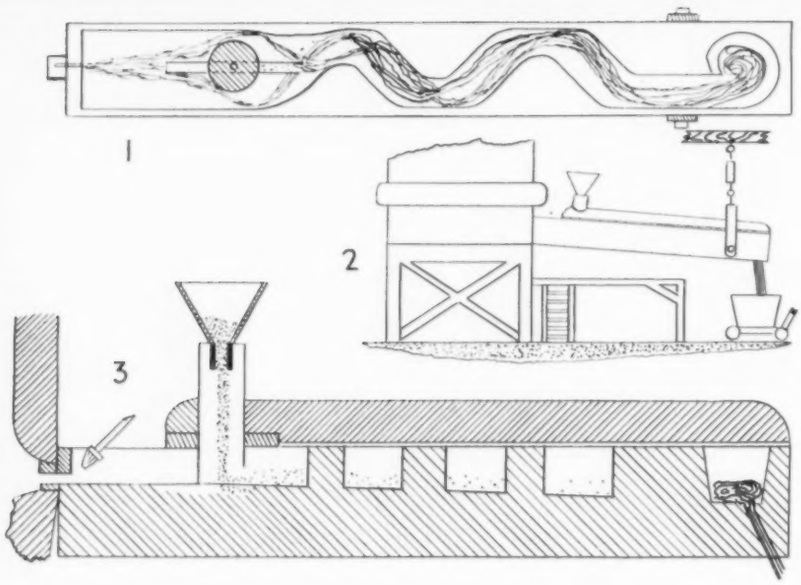
Everdur Casting Ingots



THE AMERICAN BRASS COMPANY, General Offices: Waterbury, Connecticut

In Canada: Anaconda American Brass Ltd., New Toronto, Ont. • Subsidiary of Anaconda Copper Mining Company

*EVERDUR IS A TRADE-MARK OF THE AMERICAN BRASS COMPANY, REGISTERED IN THE UNITED STATES PATENT OFFICE



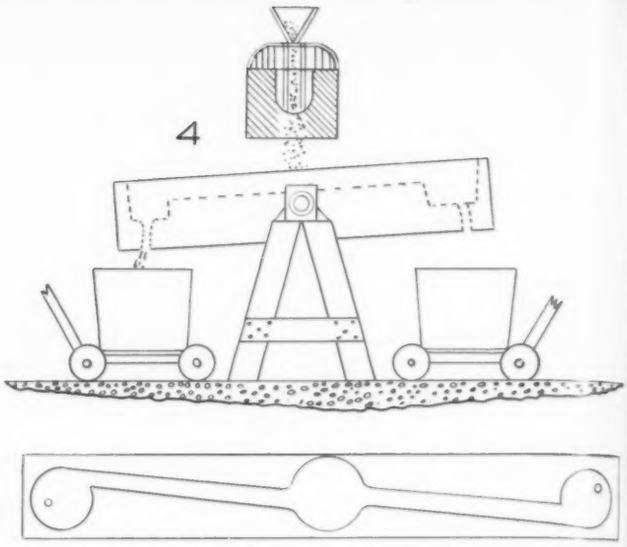


Fig. 1—Elevation of cupola spout showing stream flow. Fig. 2—Spout attached to cupola. Fig. 3—Cross sectional view of spout. Fig. 4—Arrangement for tilting type spout

Develops

CUPOLA MIXING SPOUT

By W. A. O'BRIEN

Electric Auto-Lite Co., Fostoria, O.

FOUNDRYMEN are aware that the most economical and efficient method for introducing alloys or inoculating ingredients to a molten metal is by late addition. Provided, one is assured that there will be an instant, uniform dispersion throughout the metal thereby eliminating any sacrifice in temperature, loss of valuable ingredients, or variation in chemical analysis.

The author has developed and applied for a patent on a spout and method for the introduction, by late addition, of various ingredients to molten metal, alloys, deoxidizing and desulphurizing agents, or any material which may be desired to control the physical characteristics of metal. Experience has proved the accuracy of this new method by several years of successful operation in the foundry division of the Electric Auto-Lite Co., Fostoria, O.

By this method, molten metal is conveyed from the cupola to the receiving ladle in a spout so designed that the ingredients to be added are placed in contact with the molten metal in the trough in a manner which assures that all late added ingredients will be substantially dissolved in the metal before entering the receiving ladle.

The new method shown in the accompanying illustration offers many advantages compared to the conventional method of introducing late additions.

Materials in powder form are introduced on top of the stream just before entering the baffles, or at a swirl at the end of the trough. Coarser materials are introduced through a refractory tube in front of the baffles which in turn releases the material at the bottom of the metal stream. The material instantly is covered with molten metal from either side of the trough and the stream is folded over several times as it passes through the baffles.

After the metal has pased through the baffles, it is trapped at the discharge end of the trough, immediately above the ladle where an enclosure is provided with an outlet in the bottom of the trough. The metal will tend to collect at the enclosure and thus cause a rotating or swirling action which centers at the outlet through which the molten metal flows into the ladle. All undissolved ingredients then will be subjected to the high temperature of the molten metal and be thoroughly dissolved before being carried into the ladle.

Alloys Are Dissolved

As the ladle fills, the incoming metal and late added ingredients are carried toward the bottom of the ladle insuring a completely dissolved mixture with a definite chemical reaction. Necessity of stirring or allowing the metal to set for a period of time in the receiving ladle is eliminated.

In the foundry of the Electric Auto-Lite Co. one base mix is melted throughout the day. It is necessary either to alloy or graphitize according to the type of metal desired for the various castings. Sections vary from ⅛-inch upward. The metal must be melted hot and handled quickly which does not allow time for ingredients to dissolve which are not in solution as soon as each ladle is filled. Since all bull ladles carry approximately 1500 pounds of metal the ladles must move to and from the cupola rapidly when tapping from 20 to 21 tons per hour. Any late addition method used must be accurate and instantaneous.

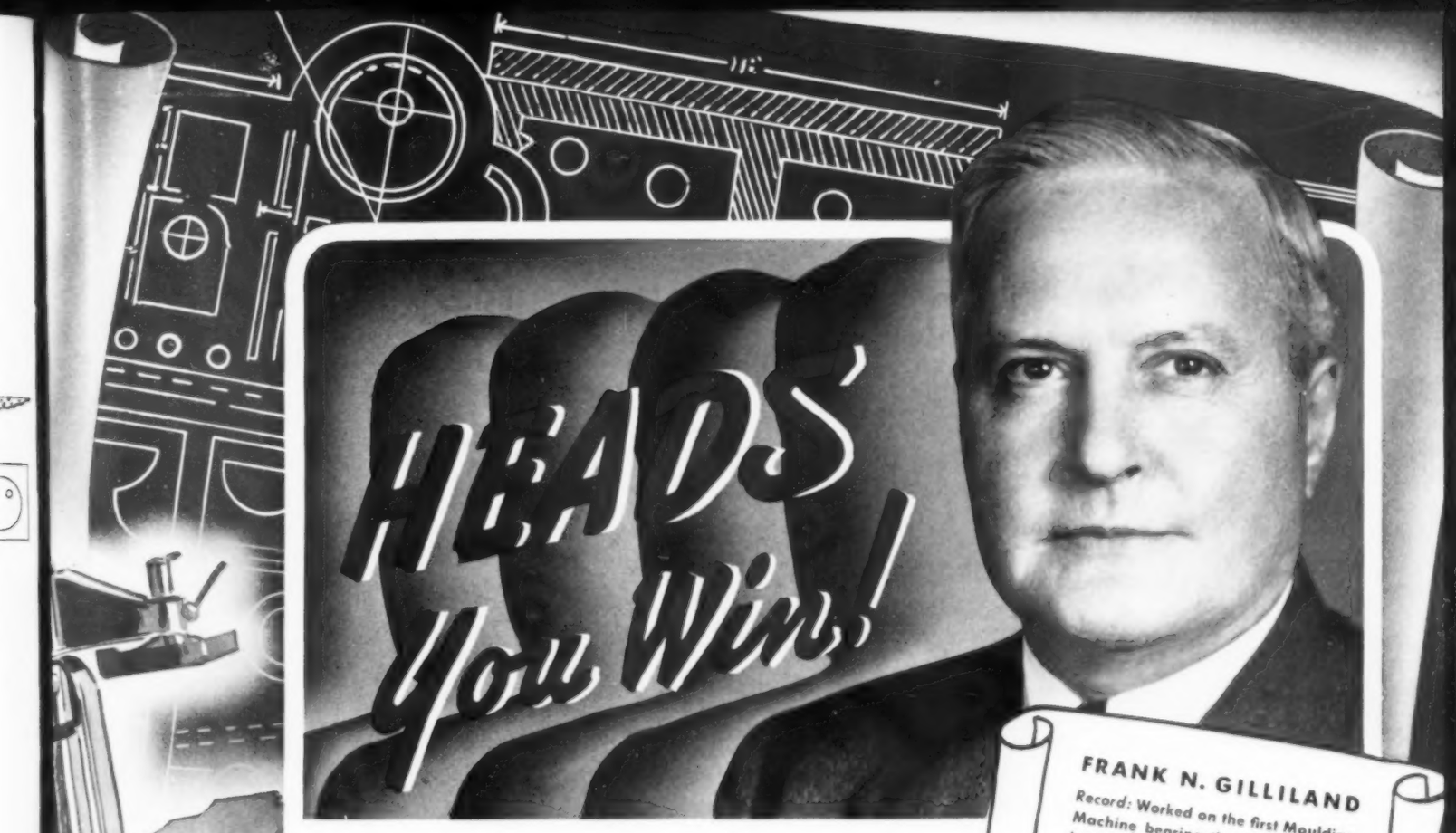
The same benefits also are gained when using this method over large receiving ladles or forehearth. All materials are definitely carried into the metal thus eliminating undissolved particles being removed with the slag.

Due to its flexibility, this method also can be arranged for any desired flow or volume of metal by changing the number of baffles, the angle of the baffles, the diameter of the outlet or the speed at which the ingredients are introduced.

Ferrosilicon, chrome, molybdenum, manganese, copper, nickel or some of the compound alloys may be added equally well without experiencing the difficulty of incomplete dissolution. As high as 31 pounds of these ingredients have been added to 1500 pounds of metal, leaving no trace of undissolved particles on top of the metal. Graphitic carbon is added readily for carbon pickup in low carbon irons and for chill control in the higher carbon irons or high scrap mixes. Calcium-silicon also easily is introduced in this manner. The amount of material used per ladle of metal may be reduced substantially yet maintain the desired physical characteristics.

Installation of the new method and design of the spout is simple and inexpensive. The tube, baffles and end blocks are fire brick material and may be purchased to fit any size spout.

(*Concluded on page* 107)



FRANK N. GILLILAND

Record: Worked on the first Moulding Machine bearing the Osborn name, built in 1909. For many years has contributed to the design and development of Osborn machines, advancing from Draftsman to Chief Draftsman and later to Chief Engineer of the Machine Division, his present post.

You're moulding the Means to Victory

on machines he engineers

• The advanced engineering that contributes so much to the mechanical superiority of Osborn Moulding Machines and Core Blowers is the special responsibility of Chief Engineer Frank N. Gilliland. Under his direction, ideas are translated into practical working drawings and manufacturing prints, and new developments have their initial wrinkles ironed out on the drawing boards of his engineers and designers.

Outstanding among American Industry's contributions to the rapid progress of aircraft output are Osborn Moulding Machines which Frank Gilliland designed for mass production of cylinder-head castings for today's powerful aircraft engines. Virtually every American battle plane, and thousands of fighting tanks and trucks, are equipped with motors whose vital cast parts were shaped on machines engineered by Frank Gilliland, and built by Osborn.

THE OSBORN MANUFACTURING COMPANY

5401 Hamilton Avenue *Cleveland, Ohio*

OSBORN

MOULDING MACHINES

FAST, ACCURATE MOULDING
BEGINS WITH Engineering
• Precision performance, paramount requirement of today's high-production moulding machines is a critically important phase of modern design and engineering.
In Osborn Moulding Machines precision begins at the drawing board and is carried straight through every step of manufacture.
Engineered right, built with sound planning, skill and care, Osborn machines are meeting today's need for an ever-increasing volume of moulds for the production of high-quality, accurate castings.
THE OSBORN MANUFACTURING COMPANY
5401 Hamilton Avenue Cleveland, Ohio
OSBORN
MOULDING MACHINES

(*Concluded from page* 104)

Most ladles are suspended from an overhead rail. Fig. 2 shows the spout as attached to the cupola with the ladle in receiving position.

Figs. 1 and 3 represent the top and sectional views of the spout showing the position and arrangement of the siphon trend, feeder tube, baffles, block and outlet, the small dots indicating the addition material. From this can be seen the flow of metal from the tap hole as it hits the tube and is thrown to either side of the spout and then back down on to the smaller stream of metal which has passed underneath the tube. This smaller stream is in turn automatically fed by a funnel shaped container immediately above the tube.

The metal then follows a tortuous path which dissolves and heats the ingredients before reaching the end of the spout and the swirl, where any undissolved material is drawn into the core of the metal stream and discharged into the ladle.

Fig. 3 is a cut section of the side view showing the tube, funnel, feeder and spout cover in place (in this particular case, it is the practice to keep the spout covered) and also a self-explanatory view showing that all late added material passing through the spout must be discharged through this outlet. The proper arrangement for tilting spouts is shown in Fig. 4.

It readily can be seen that with the use of the new spout, late added ingredients are placed in contact with the metal to be readily reacted upon by the high temperatures and therefore, assures that all added ingredients, per unit volume of metal, are completely dissolved resulting in a uniform mixture in the ladle.

Conserve Oxygen To Aid War Effort

Keeping war production industries supplied with an unceasing flow of oxygen and acetylene for welding and cutting is no less essential than providing the metals needed for production. Demand for those gases has expanded enormously, and for some time gas manufacturers have been hampered in their efforts by a shortage of cylinders. Hence, every consumer should see that empty cylinders are returned as soon as possible.

Shop practices in the use of oxygen should be surveyed critically to see that wasteful methods are eliminated. That will aid in relieving the "tight" oxygen situation, and prove economical. Recommended practices in use of oxygen include. *Use of proper size torch tip.* A No. 2 tip used where a No. 1 tip will serve consumes 10 to 20 per cent more oxygen and 16 per cent more acetylene—all wasted. *Do not use excessive pressures.* Manufacturers' rated pressures are most efficient for average conditions.

Close cylinder valves when torch is not in use. If only torch valves are closed, gas pressure in hose rises and may force leaks. *Check hose and connections for leaks.* A 1/64-inch diameter leak in a hose operating at 100 pounds will waste 290 cubic feet of oxygen in 24 hours—more than a tankful. *Use correct diameter hose.* Hose too small requires higher pressure to secure sufficient flow, causing unnecessary strain and promoting leakage in hose.

Use short lengths of hose. Long hose requires higher pressure to overcome pressure drop in hose. Surplus lengths are subjected to unnecessary wear and tear. *Use all gas in each cylinder before connecting to a new one.* Interruptions of work due to tank changing can be eliminated by manifolding or by installing pipe lines. *Keep cylinder inventory low.* Rapid turnover is imperative. Frequent deliveries make it unnecessary to carry large reserve of cylinders. Order fewer cylinders oftener.

Return empty cylinders promptly. Idle cylinders are production slackers. *Don't leave torches burning when not in use.* A torch burning idle as little as 3 minutes per hour wastes 5 per cent of its gas consumption. Five per cent of last year's industrial oxygen consumption would amount to 360 million cubic feet or enough to fill 1,636,000 cylinders which could serve a useful purpose. *Keep tips clean and free from carbon and slag.* An unclean tip is inefficient and wastes gas. *Don't abuse cylinders.* A damaged cylinder contributes nothing while undergoing repairs. *Handle hose with care.* The rubber situation is critical so make hose last as long as possible. Keep hose away from hot oxide and sparks. Wash off oil and grease. Protect hose where it crosses truck runways. Store hose stocks in cool dark place. When hose is damaged, cut out bad portion and splice with standard splicing nipples.

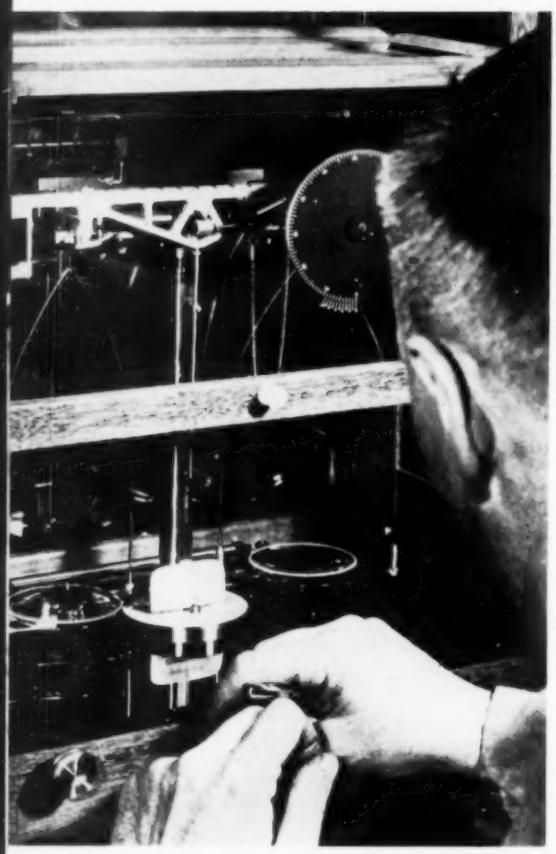
Wins Contest for War-Time Slogan

FARREL DRIVES FOR VICTORY recently was selected as the war-time slogan for the Farrel-Birmingham Co. This slogan was submitted by Jeanette Larson, office secretary, (above) in a contest conducted at the Ansonia and Derby, Conn., plants. The slogan was chosen because it expresses the thought that in building drives for the Navy, Maritime Commission and other ships, Farrel-Birmingham employes are contributing to the American drive for victory

New Steel

FOUNDRY LABORATORY

Speeds Analyses



A NEW steel foundry laboratory equipped with the most modern apparatus is the latest answer of the General Electric Co., Schenectady, N. Y., to defense production problems.

Scheduled in the fluorescent-lighted brick structure adjacent to the foundry, Gerald Zeh and Newton Sax, metallurgical chemists, are prepared to supply foundrymen with a preliminary quantitative analysis of a steel sample within one-half hour after it has been removed from the foundry furnace.

Shows Amount Required

That analysis includes the determination of the amount of carbon, manganese, and molybdenum present and the quantities that must be added to the molten metal in the furnace to produce an alloy with the desired characteristics. Subsequent analyses determine the amount of other elements present, such as silicon, sulphur, phosphorus, chromium, and nickel.

Three small electric furnaces with vacuum-tube controls are available for gravimetric determination of the amount of carbon in a sample. The sample is heated and oxygen passed over it. The subsequent chemical reaction produces a deposit of sodium carbonate in a test tube containing a known weight of caustic soda, or sodium hydroxide. The amount of carbon that was present in the sample is indicated by the increase in the weight of the test tube.

A titration table, equipped with a battery of pressure-fed burettes, or long, graduated glass tubes, is used to determine the quantities of other elements present that can be analyzed volumetrically. Solutions made from the samples are mixed with control solutions until certain color changes occur. The amount of control solution that was added indicates the quantity of the element present. A daylight fluorescent screen behind the titration table facilitates color comparisons and burette-scale readings.

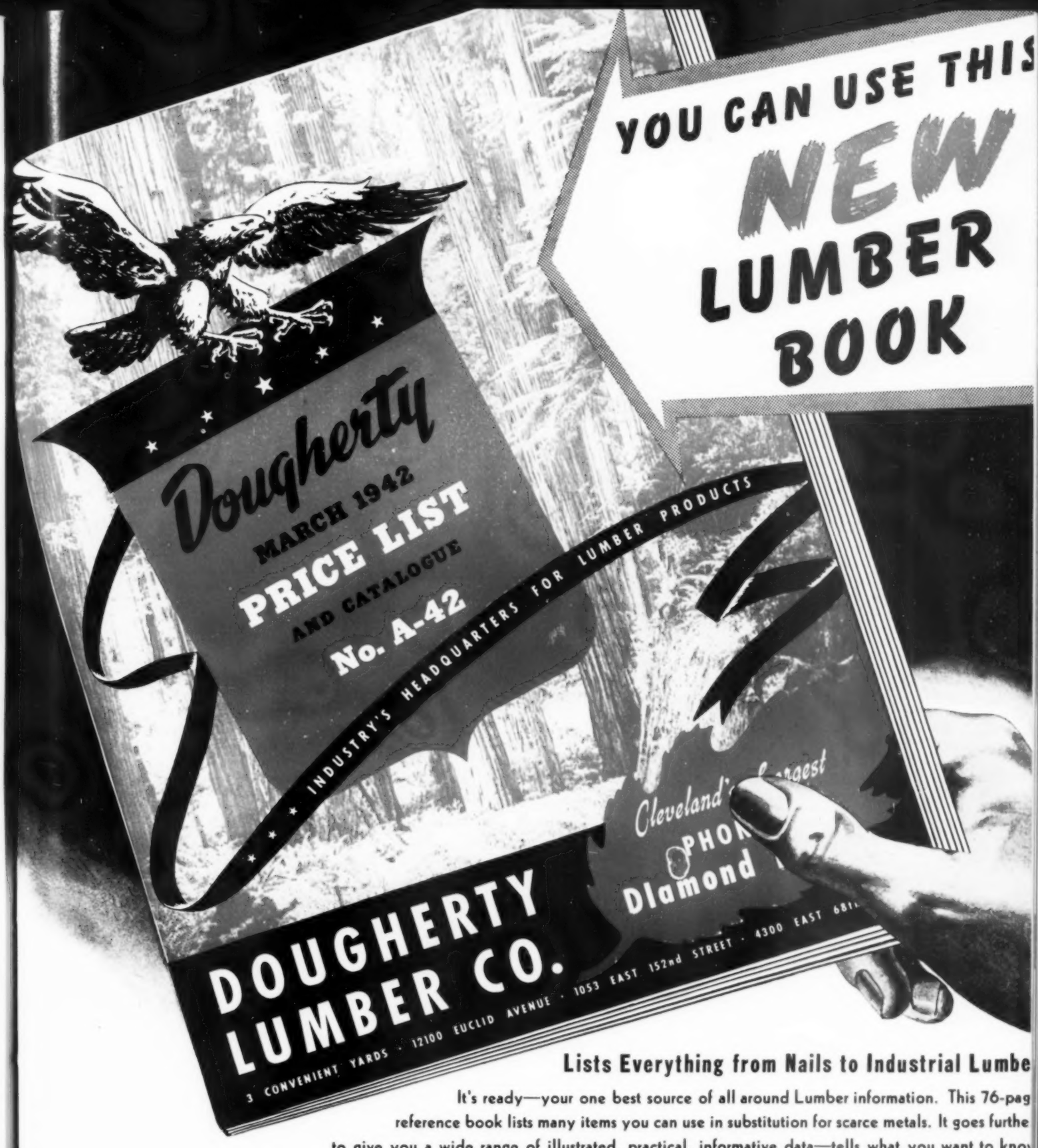
Balances Are Accurate

Accurate weighing also is important in steel analysis. Balances, accurate to within one three-hundred thousandth of an ounce and capable of giving one three-millionth of an ounce, are mounted on a slate-covered vibration-proof concrete pier separated from the buildings. This pier is sunk four feet into the ground into the center of the laboratory and is surrounded by cork board that serves as a shock absorber.

Tanked oxygen and piped city gas, compressed air, vacuum, steam, and water are available at the turn of a faucet or thumbscrew. As many as 145 quantitative analyses have been run by Mr. Zeh and Mr. Sax in a 24-hour stretch.

Hercules Powder Co. has moved its offices in Detroit to larger quarters in the Fisher Building. Philip F. Robb recently has been transferred from Wilmington, Del., to act as manager of the Detroit office. He has been associated with the company since 1923.

Above—Balance is mounted on a floating pier foundation to eliminate vibration. Right—Drawing combustion boats from furnace after carbon content determinations. Far right—Light colored screen behind titration stand has daylight fluorescent lighting



Lists Everything from Nails to Industrial Lumbe

It's ready—your one best source of all around Lumber information. This 76-pag reference book lists many items you can use in substitution for scarce metals. It goes furthe to give you a wide range of illustrated, practical, informative data—tells what you want to kno about wood for hundreds of industrial purposes. Puts Dougherty's three big yards and nation-wide facili ties at your finger tips. Make a note to have your secretary get your copy. It's free.

The DOUGHERTY LUMBER Co.

DI 1200

4306 EAST 68TH ST. CLEVELAND, OHIO

the adventures of Bill

BY PAT DWYER
Drawings By RICHEY

SOME times," said Bill the other night, "I wonder if there is some thing in the old sayings that people toss around as cheerfully and carelessly as if they had invented them there right on the spot. A fellow who never had an original idea since his mother washed him in a dish pan and hung him up to dry like an old wrinkled sock, springs one of the old hoary and moss covered remarks and indirectly tries to convey the impression that it is a bright shining coin freshly stamped in his own private mental mint.

"At other times, or as you might say, on the other hand, I hear or read an item which shows that one of the old sayings, even if tattered and torn like an old battle flag, or a poster hanging on the wall after an election, still hits the spot as neatly and accurately as a bomb dropped down the funnel of a marauding enemy vessel."

"Happy landing", I said, "and more of them. Fortunately the bombers are more skilful than some people whose names I do not care to mention, but who or whom—take your choice—I could touch with a pole considerably less than 10 feet in length, if I felt so inclined at the present moment, and if I had a good, stiff pole preferably with a keen, sharp point."

"Ah! Impetuous youth. Always jumping ahead of the gun. You forgot to add the old reliable sting remover 'Present company of course, always excepted.'"

"You are some little jumper yourself I did not forget."

"Well, of course if you don't want to hear about the two old molders who started a little foundry in a chicken coop and now are knocking out castings for the navy, there is nothing more to be said. I should not have brought the subject up."

"'Glorybitagod'—to quote your sterling old uncle Malachi—Here all this time I labored under the impression that you were floundering around like a blue bottle fly in a spider web. Talking, if you please, about old sayings, when in reality, if I was not so dumb, I should have known you were talking about two old molders in a chicken coop. I have seen old molders and young molders in many a queer dump, including the basement, the back kitchen, the old red barn and the well known dog house, but this is the first intimation of any members of the ancient brotherhood practicing the art in a chicken coop. Just the same, if no military secret is involved, and to keep the record clear, I should like to know what possible connection there is between old sayings and the activities of two veteran sand pounders."

"Well," said Bill, "I'll tell you. I was just leading up to it kind of gradual. Sudden shock or excitement of any kind is not so good for old birds—"

"Meaning? The jingle, jangle of yuh spuhs, Suh, hes cahed yuh a-way off the trail. You may be interested to learn that a short time ago I consulted an eminent astrologer in brown robe and skull cap lurking in a cell in the catacombs under the Ivanhoe in Chicago. He revealed the past, the present and many interesting events in the far distant future."

Ex-foundryman casts horoscope

"I should not be surprised," Bill exclaimed, "to learn that you bumped into the Saginaw Kid. He used to bum around with Billy Mallet and Tommy Graham before he quit the trade and joined a medicine show about 30 years ago and gradually picked up this here now astrology business. One look at your bandy legs and drooping shoulders and he had your number for the past and present. The future of course was the regular professional baloney.

"By the way that reminds me of what I was saying some time back when you rudely elbowed me off the track. Did you ever hear the old saying 'What's in a name?'"

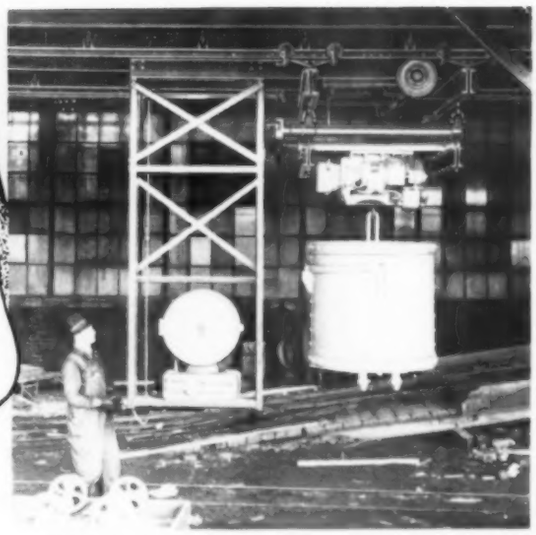
"Certainly," I said, "It is one of the best known quotations from the late Mr. Shakespeare's famous tragedy Romeo and Juliet. I would not care to put the statement in writing, but if the old memory is any guide, I should say off hand the lines appear in Act 11, scene 1 where the fair Juliet is doing a mild bit of ladylike crabbing about the silly reason which prevents a martimonial union between his family the Montagues and her family the Capulets.

"Posed as per direction of the prompter, left foot slightly advanced, left hand on hip and right hand pressed against bosom she says: 'What's in a name?' Meaning of course, as even the peanut munching gods in the gallery understand, why should a name separate two loving hearts. The aged and rankling fued between the families meant nothing to her. Romeo was her own little pet Romeo and she did not care whether his last name was Montague, Mumps or McGorry. Hence the heart rending wail of the maiden 'What's in a name?' Assuming after the fashion of women that the object of her devotion and adoration was not as quick as he might be on what the Scottish people call the uptake, she amplified the remark with 'That which we call a rose, by any other name would smell as sweet.'"

"You mean she took a sniff at him?

(*Continued on page* 113)

You Can Accelerate Your Rate of Production as Rapidly as You Release Man Power from Handling Labor



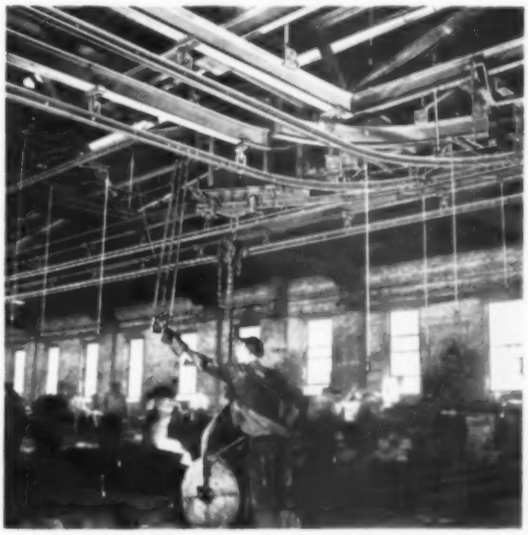
Power operated charging crane with built in scale and electric hoist.

THE battle of production, too, can be won in the air. That is, on overhead handling equipment.

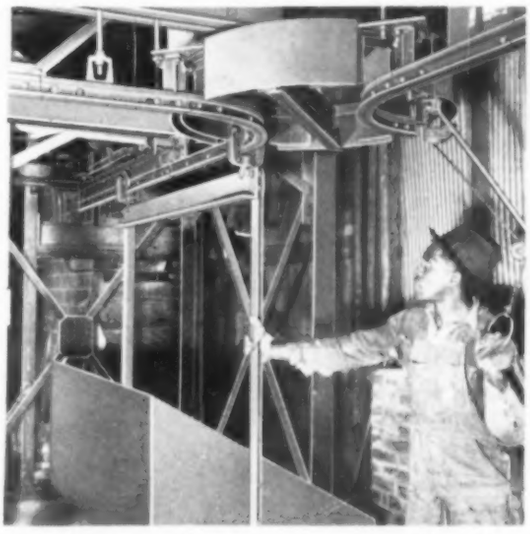
American MonoRail Equipment will increase your production and afford a substantial saving in your handling problems.

You can accelerate your rate of production as rapidly as you release man power from handling labor—illustrations show how this can be done with American MonoRail Equipment.

Let an American MonoRail Engineer explain many other advantages of overhead handling equipment. Regardless of size of installations, from the simplest to the most complicated, our engineers can help solve your handling problem. This service is without cost or obligation. There is no delay or shut-down during installation. Write today.



Airlift quickly raises ladle to track on upper level.



Special rotary switch with charge carrier rolling on elevator to charging floor.

Write for Blue Book illustrating hundreds of MonoRail installations.

THE AMERICAN MONORAIL CO.

13104 ATHENS AVENUE ★ CLEVELAND, OHIO

Four GOOD REASONS FOR THE WIDE USE OF CRUCIBLES IN THE FOUNDRIES OF TODAY & TOMORROW

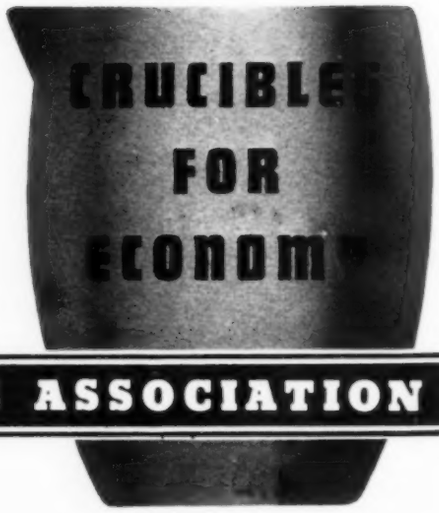
1 FLEXIBLE

2 ADAPTABLE

3 ECONOMICAL

4 .....FAST

DETAILS? WRITE THE ADDRESS BELOW



CRUCIBLE MANUFACTURERS ASSOCIATION

90 WEST STREET, NEW YORK, N. Y.

(*Continued from page* 110)

There is an old saying to the effect that love is blind, but apparently that is only the half of it. If she labored under the delusion that Romeo, a 16th century Venetian gigolo, smelled like a rose she should have the old beak reamed or re-bushed, or whatever it is these beak specialists do to people whose sense of smell is as vivid as the sight of a bat in a coal mine. How old was this dame with the smuffy sniffer?"

"The lady, you poor deluded misogamist, was as young and beautiful as any of the ladies in song and story, or as the charming young brown-eyed damsel you adored when you were living in the enchanted period between 18 and 21. In a word, if I may borrow from your vocabulary, she was a cuddly honey."

"Up with your helm," said Bill. "All hands stand by to go about! I ask you a simple question and you give me a chapter from Laura Jean Libby. You also call me a misiog something or other. I don't know what it means, but I have my suspicions. Beware, my fine downy old cove. If I find that it means what I think it means, I'll go ketch me a banshee in good howling order and have her wail outside your window every night until you wish that Romeo and Juliet took you with them when they hopped the twig.

"This what's-in-a-name thing came to mind recently when I read in an eastern paper a feature story that proved that the flame of patriotism never dies. The story also bore witness to the startling truth that molders never grow old. Two sprightly young lads who coyly admit ages of 77 and 73 operate a small foundry in Phillipsburg, N. J., where they make sirens—'howlers' in the chaste gob vocabulary—and other aluminum castings for the United States Navy."

"Well," I said. "So what?"

"So what, hey? One man is named Benjamin Franklin Harpel and the name of his sturdy partner is Abram Elias Laubach. What would you expect from a man named after that sterling patriot, philospher and all-around A-1 American, and another named after one of the great old Shepherd Kings of Israel?

"In his youth young Harpel learned his trade in his father's shop in Bernville, Pa. Later, after the fashion of young molders in those days, he took a gander around the country to acquire knowledge and experience. When he felt that he had collected a sufficient amount of these useful and highly necessary aids to a man on the lower rungs of the ladder he built and operated a foundry at Topton, Pa., and afterward another foundry at West Hamburg, Pa. About six years ago he decided that maybe there is something in the old saying 'All work and no play makes Jack a dull boy.' So, he says to himself, 'I have been working long enough. I'll take a whirl at this play stuff, while the playing is still good.'

"Following the example of Old Uncle Ned, but of course for a different reason, he hung up the shovel and the hoe and for several years ate well, slept the sleep of the just, and carefully refrained from the slightest exertion, mental or physical. If any person in his presence mentioned the foundry he contorted his face into a grimace indicating grievous pain, held up both hands in protest and coldly inquired, 'Why bring that up?'

"Then the long smoldering war embers in Europe broke into flame. With millions of his fellow citizens Bro. Harpel figured the flame was too far away to have any effect on his life, liberty or pursuit of happiness. He saw no particular reason for getting excited when Uncle Sam as a preliminary measure hung two signs on his far-flung Atlantic and Pacific seaboards. One was adopted from another time and another people, 'What we have, we hold.' The other while apparently simple, plain and straightforward, carried a mild hint of belligerence, 'Keep out. This Means You.' No names were mentioned, but the general opinion seemed to be that the warning was intended primarily for a little moustached gent in jack boots suffering from a severe attack of delusions of grandeur, and secondly for a snake in the bush known among those who never indulge in coarse language as the Yellow Peril.

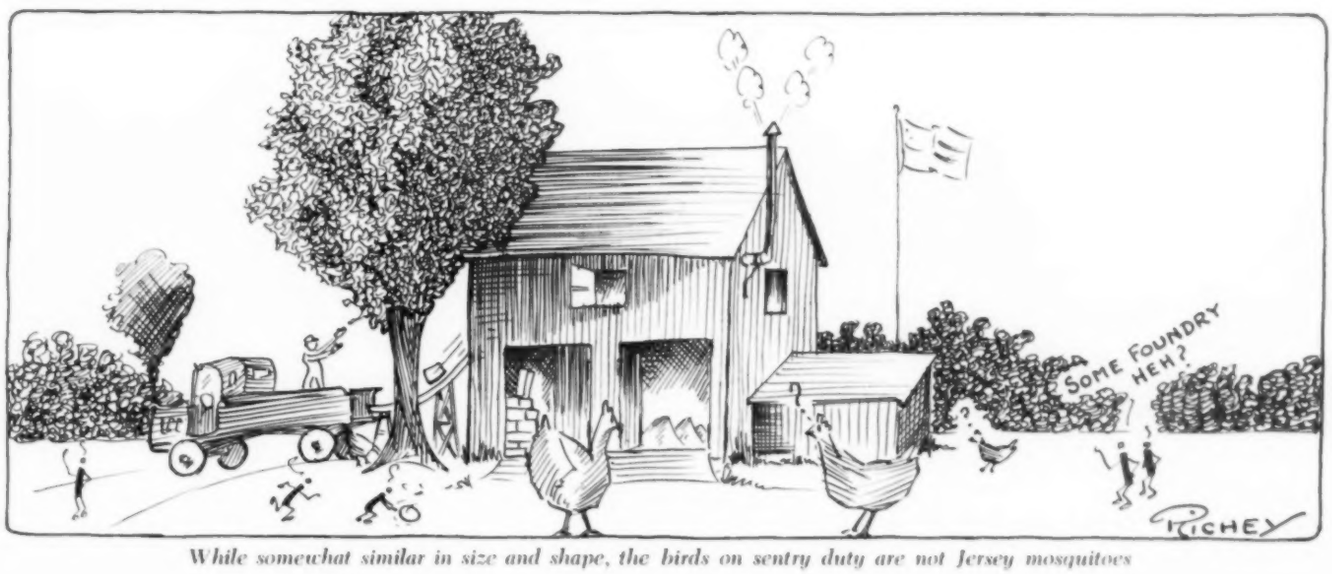
"When the snake sneaked up and buried its poisoned fangs in Pearl Harbor, when the screaming bugles and roaring drums called millions of men to the colors, the namesake of Benjamin Franklin ditched the play clothes and sprang to attention. Prohibitory age rules prevented his acceptance in any branch of the armed forces afloat or ashore. He was confronted with a similar situation and attitude when he offered his services to the industry in which he had spent the greater part of his long life and in which he had played a prominent part.

"'OK,' says he, a man of few words. 'I'll show 'em.'

"He persuaded Abram Elias Laubach to throw in with him. He did not want any young superman filled with vim, vigor and vitality who could put up 100 molds and lose half. He wanted a seasoned veteran with approximately the same background of training, knowledge and experience as himself. A man who could turn his hand to any job in the shop. Who knew how to prepare his sand, make molds, cores, melt the metal, pour it, shake out the castings and clean them. He did not want a partner who spent half his time watching the clock, and be halfway out the door before the whistle stopped blowing. He wanted a steady man with some idea of responsibility. Abram before his retirement had worked for 35 years for Wilson Bros., Easton, Pa.

"They cleaned out an empty two-story

(*Concluded on page* 160)



While somewhat similar in size and shape, the birds on sentry duty are not Jersey mosquitoes

among Detroit foundries

BY A. H. ALLEN
Detroit Editor, The Foundry

BACK in 1937 when the full bitterness of sitdown strikes held sway throughout the motor industry, one major demand of unionists was elimination of the piece-work system of pay and group bonus systems, in favor of straight hourly rates. Upshot of the situation was that on virtually all jobs, piecework and bonus systems were thrown out and straight hourly rates instituted, which effectively leveled off productivity to the plane of the least efficient workmen.

In 5 years there has been a progressive drop in plant efficiency throughout the automotive industry, accompanied by a natural increase in costs. But the industry has been fortunate in being able to keep improving production processes and material utilization so that the increased labor costs were just about matched and no sharp increases in price of the products were necessary.

One department which has adhered to the old piecework system throughout recent years has been the coreroom in foundries. Since output of cores is so vital to maintenance of castings production, it has been felt absolutely essential to insure production by retaining the piecework system. Lately, however, the CIO has renewed pressure for changing coremakers to straight hourly rates, and even has gone so far as to dictate to coremakers how many pieces they shall turn out in a day. Result has been a serious bogging down of foundry production in certain plants.

One case which has been given some publicity is that of a producer of piston rings for aircraft and truck engines. Piston ring molds are made in stacks of 12, and a good workman will turn out a stack in about 4 minutes, or from 115 to 120 stacks in an 8-hour day. Two years ago the plant was unionized and until recently production had been proceeding at a rate of around 12 stacks an hour, or 96 per shift.

One night, a group of union stewards from the foundry met and decided to reduce the rate of production to 85 stacks a day. The following day, one of the men on the molding line completed his 85 stacks a half hour before quitting time and, according to fellow workmen, was about to leave when his foreman told him to remain at his bench and kill a half hour until quitting time. Instead he went on making molds but before letting go of them plugged the pouring gates, simply to show his resentment over the arbitrary reduction of the production rate by the union.

Friction continued for a couple of months at the plant and someone finally informed the FBI which last month stepped in and arrested this employe on the charge of destroying defense materials. He was released on bail and returned to work. Since his arrest he has shut up like a clam and refused to make any further comments. When a reporter from the *Detroit News* inquired of some of the men at the plant why they wanted to reduce the production rate in the first place, he was told, "This work won't last forever—the longer we string it out, the longer we'll have work."

The vice president and general manager of the company is quoted as saying that restrictions of production by the union have been in effect at the plant from time to time over a period of 2 years and recently have been extended drastically, in some departments production being cut nearly 20 per cent. He estimates that if the men were allowed to produce at a natural, normal rate throughout the plant, an overall increase in production of 10 per cent would be possible.

There is nothing unusual about this sordid story. The same situation holds true in other localities—Flint, for example, which has been and still is a hotbed of labor unrest, some of the original sitdown strikers still working in that territory. In one General Motors plant, union stewards arbitrarily reduced the production rate on a certain foundry operation from a normal of around 45 pieces per hour to 20 per hour, simply to force management to establish an hourly rate instead of piecework. Workmen seeking to exceed this limit—and it is really difficult to hold down production to the low rate—have been threatened openly in the plant, and there have been near-fisticuffs between union stewards and shop foremen.

(*Concluded on page* 116)

A new member of our armored forces, an M-4 tank, meets an older M-3 at a fueling point at Fort Knox, Ky. With its superior construction incorporating cast steel turret and hull, and increased fire power, the M-4, shown at the left is very popular with the hard-bitten "tankers" who man it. Official OWI photo by Palmer

Wings FOR PRODUCTION LINES

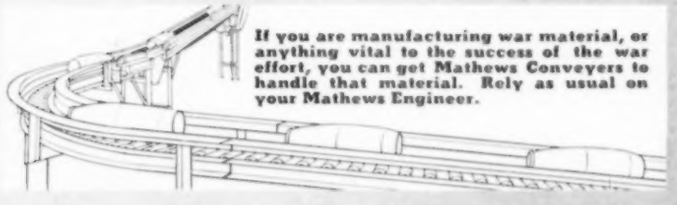
American Industry has one job to do today — get the stuff out better and faster. It just has to be done. There will be no second money paid in this game — either we win or we don't.

Perhaps your production seems to be lagging, and not what you might have hoped it would be. It might be that part of the trouble could be found in your Conveying Equipment or the lack of it.

Your Mathews Engineer would be able to work with you and offer his Engineering experience toward the solution of your problem. You know what has to be done — he might be able to help you do it.

MATHEWS CONVEYER COMPANY

ELLWOOD CITY, PENNSYLVANIA



If you are manufacturing war material, or anything vital to the success of the war effort, you can get Mathews Conveyers to handle that material. Rely as usual on your Mathews Engineer.

MATHEWS CONVEYERS FOR MECHANIZED PRODUCTION

(*Concluded from page* 114)

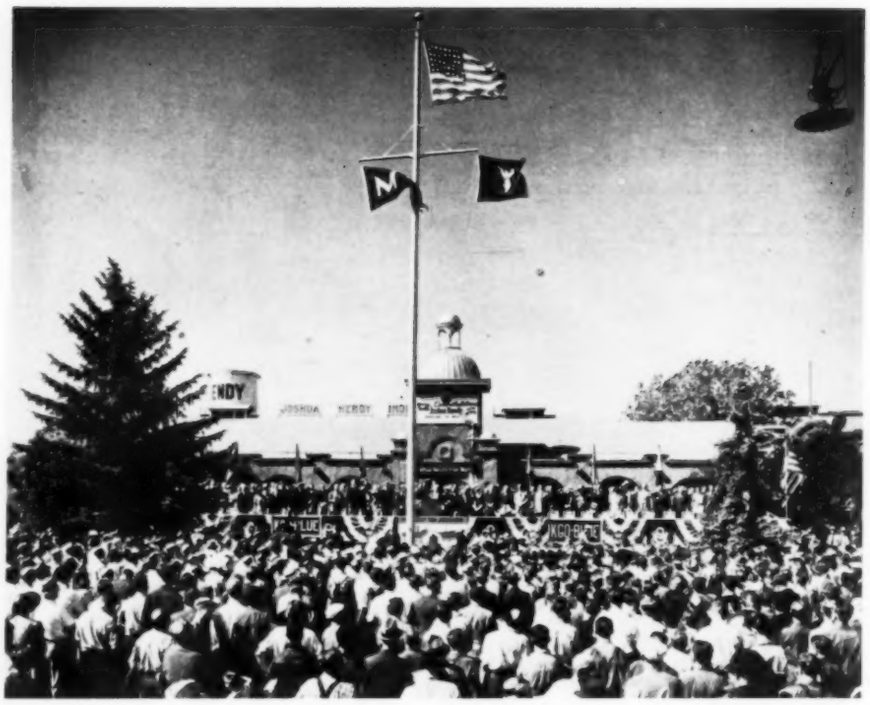
These ideas amount to sabotage today, when the safety of the nation is so vitally dependent upon war production. The situation is one for immediate action on the part of the government.

The war news grows progressively worse and is possibly the surest indication that some severe steps will be taken. In fact, these may already have started. Take the reported case of an aluminum foundry in Ohio which is supplying castings to a number of manufacturers in this territory. This foundry has a large number of young workmen, with perhaps 75 per cent either in draft class 1-A or deferred because of war work into 2-B. Many of these chaps have been working for only a few months and are earning, with overtime, an exceptionally high pay. Recently some of them decided to start some "production control" of their own. It is reported that in the space of three days the ringleaders were corralled by government representatives and their draft classification had been changed to 1-A for immediate call.

Possibly a little more extensive treatment of this sort will bring the realization that we are fighting a war and that any interference with reasonable production rates is going to be dealt with summarily by the armed services.

Substitution of a casting for steel tubing in an important machine gun part has resulted in reduction of 45 per cent in machining time and appreciable reduction in machining scrap, according to word from an automotive plant now producing these guns by the thousands.

The new part is of a special cast steel developed by an automotive foundry. Sample parts were submitted to army inspectors and came through rigorous tests undamaged. The section of steel tubing which the cast part replaces weighed 20 pounds in the rough and was machined down to a thin cylinder, pierced with numerous holes, and weighing less than 5 pounds. Change to a casting resulted in only 1½ pounds of scrap, with consequent reduction of machining operations.



Maritime "M" burgee and the Maritime victory flag were awarded to the Joshua Hendy Iron Works, Sunnyvale, Calif. for outstanding achievement in the production of engines for the United States maritime fleet. The pennant and flag were raised aloft by four veteran employes of the company at a signal from Admiral H. L. Vickery, vice chairman, U. S. Maritime Commission, who made the presentation

Given Maritime "M" And Victory Flags

Joshua Hendy Iron Works of Sunnyvale and Long Beach, Calif., was awarded the Maritime "M" by the U. S. Maritime Commission, July 23. It is stated that this company is the first in California and one of eight in the country to receive this award. Armiral Howard L. Vickery, vice chairman of the Maritime Commission presented the Maritime "M" burgee and the Maritime victory flag to the company, and the merit insignia badges to its employes at a colorful ceremony on the company's grounds at Sunnyvale, while the personnel at Long Beach listened in over a public address system. Speakers on the program included Carl Flesher, West Coast director of construction, Maritime Commission; Governor Culbert L. Olson; Joseph S. Thompson, president, Pacific Electric Mfg. Co., who was the master of ceremonies at the presentation; as well as Charles E. Moore, president of the Joshua Hendy company who accepted the award on behalf of the company, and H. C. Gunetti, general superintendent, who also spoke briefly in accepting the award. Morris Levit, who has served the company for 53 years and Manuel Dutra who has been connected with the organization since 1909, responded on behalf of the personnel.

(Left to right) Admiral H. L. Vickery, Carl Flesher, Charles E. Moore, president of Joshua Hendy Iron Works, and Felix Kahn, vice president, on a trip through the Hendy plants at Sunnyvale, Calif., preceding the award of the Maritime "M" to the company

Important

ANNOUNCEMENT

EFFECTIVE IMMEDIATELY

Our used and rebuilt equipment business will be conducted under a new name,

SCULLY MACHINERY & EQUIPMENT CORP.
(Formerly Foundry Division of Scully-Jones & Co.)

and at a new address,

2031 WEST 74th STREET, CHICAGO, ILLINOIS

where our warehouse and office facilities have been more than tripled.

WE BUY AS WELL AS SELL ALL TYPES OF INDUSTRIAL EQUIPMENT

- Molding Machines
- Blowers
- Overhead Electric Cranes
- Sand Mixers
- Furnaces
- Core Ovens
- Trucks
- Compressors

NOW—MORE FOUNDRY EQUIPMENT THAN EVER TO CHOOSE FROM

In our new location, we will occupy over 50,000 sq. ft. of floor space and have greatly improved facilities for rebuilding and stocking an increased number and variety of items for use in the foundry and allied industries. Henceforth, we will be able to offer you an unusual selection of good, used equipment including overhead travelling cranes in capacities from 2 to 50 tons and spans up to 80'. Our new location has railroad siding facilities so that shipment to you will be greatly speeded.

IMMEDIATE DELIVERY ON MANY ITEMS—GOOD DELIVERY ON MOST OTHERS

Our increased facilities have made it possible for us to speed up the rebuilding of equipment considerably. As a result, we can give unusually fast service in taking care of your requirements—or supplying equipment which can be adapted to your needs.

J. A. SCULLY
President

R. P SCULLY
Vice President

SCULLY EQUIPMENT ALL REBUILT IN OUR OWN MACHINE SHOP

- Machine Tools
- Pattern Machinery
- Sprue Cutters
- Electric Riddles
- Sandblast Equipment
- Air Tools
- Grinders
- Crane Motors

SCULLY MACHINERY & EQUIPMENT CORP.

(Formerly Foundry Division — Scully-Jones & Company)

NEW ADDRESS

2031 WEST 74th STREET
CHICAGO, ILL.

TELEPHONE:
PROSPECT 8770

DISTRIBUTORS OF RE-CONDITIONED AND NEW FOUNDRY AND INDUSTRIAL EQUIPMENT

Can You Answer the Questions When the Fireman Calls?

FURTHER developments recently have been made in the application of the "Code of Recommended Practices for the Protection of Life, Property and Production in the Foundry Industry during the War" as prepared by the Industrial Hygiene Codes Committee of the American Foundrymen's Association, to the entire industrial protection problem of the Chicago metropolitan area. After the code had been issued to all industries in the Chicago area, as was mentioned in the August issue of THE FOUNDRY, Chief of Industry, P. H. Joyce, Chicago metropolitan area, realized that some check up should be made to see if the code material was being used to advantage by the various industrial plants. A number of plans were discussed by the OCD in Chicago, and James R. Allan, International Harvester Co., and chairman of the A.F.A. committee, before the final plan was adopted. This consists of having the municipal fire department personnel call upon top ranking executives in every industry to survey the situation. The questions which are asked all have to do with the code of recommended practices which previously was supplied each executive and the answers may be found in the code.

The accompanying illustration shows the questionnaire form which is being used by the firemen. The form is filled out in duplicate, one being retained by the fire department and the other being forwarded to the office of the chief of industry where the answers are reviewed carefully. If it appears that the employer has not been giving sufficient thought and attention to plant protection, he is either called on the telephone or asked to visit the OCD office and is given a sales talk on better co-operation with his community. He is also urged to take proper steps to protect the lives of his employes, the property of his company, and the production of his plant, vitally needed in the war program. Firemen were chosen for the job because there is no other organized group better able to handle the assignment. From a psychological standpoint it would seem that everyone likes the fireman whereas not everyone appreciates a call from a policeman. Also, the fireman has a better idea of industrial problems particularly building construction and fire prevention work.

Questionnaire used by firemen in checking on plant protection in the Chicago area. Answers to these questions may be found in the articles, "Code of Recommended Practices for the Protection of Life, Property and Production in the Foundry Industry during the War," presented serially in the May, June, July and August issues of THE FOUNDRY

OFFICE OF CHIEF OF INDUSTRY, OFFICE OF CIVILIAN DEFENSE, CHICAGO METROPOLITAN AREA

PLANT PROTECTION INSPECTION REPORT

Name of Plant ..... No. of Employees .....
Address .....
Party Interviewed ..... Title ..... Phone No. .....
Has a copy of Code been received? ..... Serial No. ..... Is copy wanted? .....
Is the plant doing any war work? ..... Working how many shifts? ..... How many days? .....
POLICE: Has plant personnel been investigated? ..... Fingerprinted? .....
Are employees required to wear identification badges? .....
Are plant visitors checked and identified? ..... Given badges? .....
Has a plant defense coordinator been appointed? ..... For each shift? .....
Is there a plant police department? ..... Number ..... Armed? ..... Deputized? .....
What distinguishes police from other employees? .....
Are day patrols maintained? ..... Night patrols? .....
Are all gates and entrances guarded? ..... Number of entrances .....
Are trucks, vehicles, freight cars and boats inspected on arrival? .....
FIRE: Construction: Fireproof ..... Mill ..... Ordinary ..... Floor Area .....
Height, stories .....
Is adjacent property a fire hazard? .....
Is there a plant fire department? ..... How many full-time firemen? .....
Number of volunteer firemen ..... Frequency of drills .....
Is size of fire department adequate for all emergencies? .....
Are premises sprinkled? ..... Are sprinkler valves open and sealed? .....
Are all sprinkler and fire system valves plainly marked? .....
Are there sufficient hose connections? ..... Number ..... Size of hose .....
What sources of auxiliary water for fire-fighting? .....
Types of portable extinguishers: ..... Are they sealed? .....
Are they in working order? ..... Frequency of inspection .....
Are there sand boxes and shovels on roofs? ..... Barrels of water? .....
Other means for fighting incendiary bombs .....
Are there gas masks for any toxic gases and fumes to be encountered? .....
Does good housekeeping prevail? .....
How often are fire inspections made by plant organization? .....
Are police and firemen instructed in the fire problem? .....
Have fire watcher stations been located on highest roofs? ..... Number .....
Have fire watchers been appointed? .....
YOUR GENERAL REMARKS ON FIRE PROTECTION: .....

MEDICAL: Is there a plant medical department? ..... No. of doctors ..... No. of nurses .....
Number trained in Red Cross First Aid ..... Is there a dispensary? .....
Number of stretchers ..... Are they properly located around plant? .....
ENGINEERING: Is there a plant engineering chief? ..... For each shift? .....
Are all maintenance men under his supervision? .....
Have emergency tools and equipment been provided? .....
Are all substations, power houses and boiler houses under lock and key? .....
Are fences necessary around plant? ..... Is plant fenced? .....
Are gas, water and electric utility entrance valves and switches to plant properly identified? .....
Are they protected against tampering? .....
BLACKOUT: Are there operations that produce fire and glare visible outside? .....
Have means been provided for blacking out the fire and glare in an emergency? .....
Has the plant practiced a blackout? .....
Has the plant worked out details for a blackout if official orders are given? .....
Can city fire equipment get through plant roadways? .....
If plant has not started any protection program when will it do so? .....
When should the plant be interviewed again? .....
What is your general impression of their plant protection efforts? .....

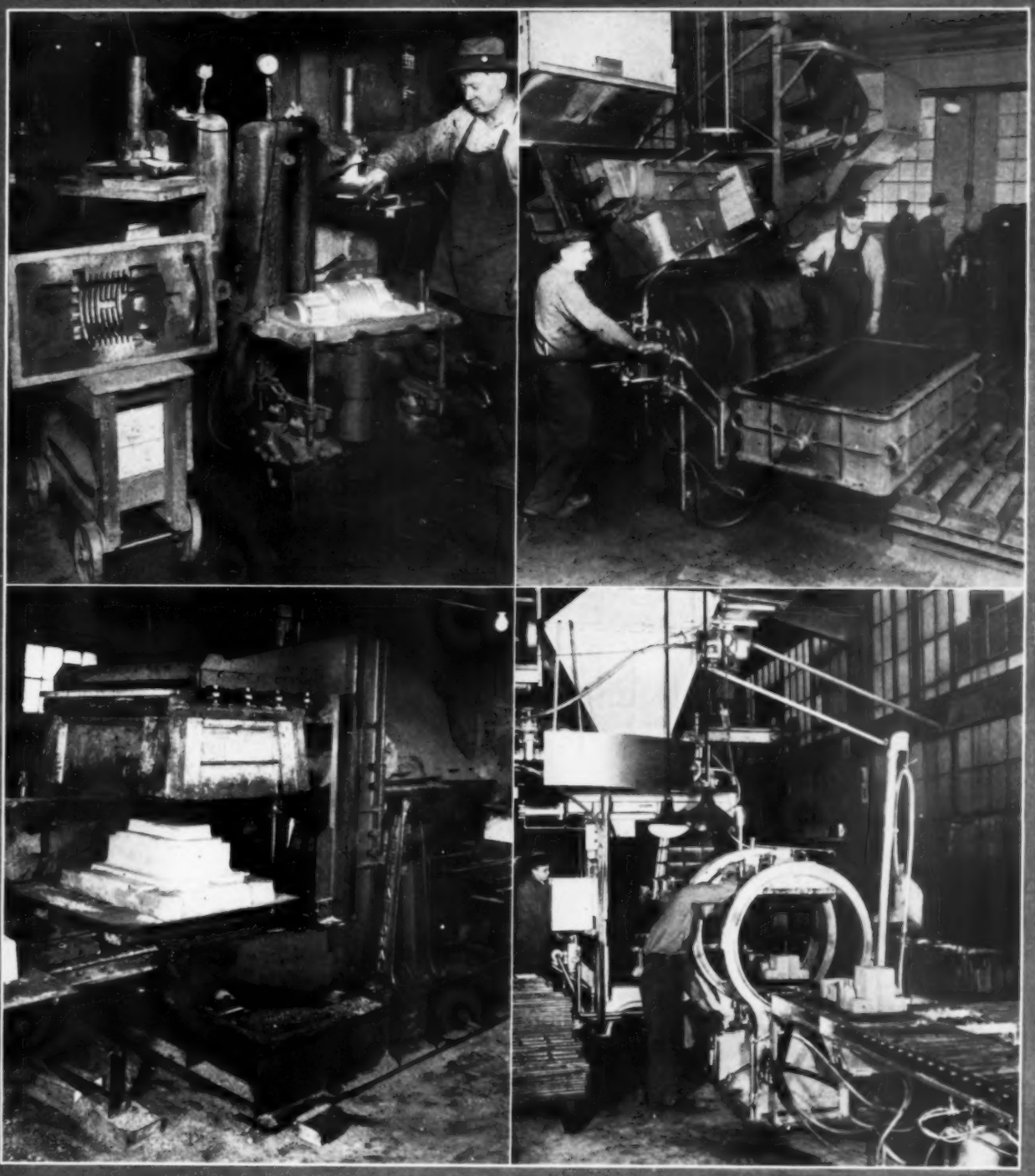
INSPECTOR ..... DATE 194

Industry Is Fortunate

As has been pointed out repeatedly, the foundry industry is most fortunate in that the industrial hygiene codes committee of the A.F.A. has led in the work of preparing a code for the protection of plants. This code was presented in the May, June, July and August issues of THE FOUNDRY. With this excellent start, the committee believes that every foundry executive should be most active, not only in seeing that proper steps are taken to protect his own plant, but in establishing complete protection for all industries in the immediate region.

The committee suggests that each reader take a look at the accompanying questionnaire. If you cannot answer the questions properly, you should get busy immediately and "do something".

Allis-Chalmers Mfg. Co., Milwaukee, has published a 54-page booklet entitled, "Patent Background for Engineers" containing a series of articles originally appearing in the firm's *Electrical Review*. Written by patent attorneys and engineers for the lay mind the articles avoid legal verbiage and describe the principles of patent law in an entertaining style.

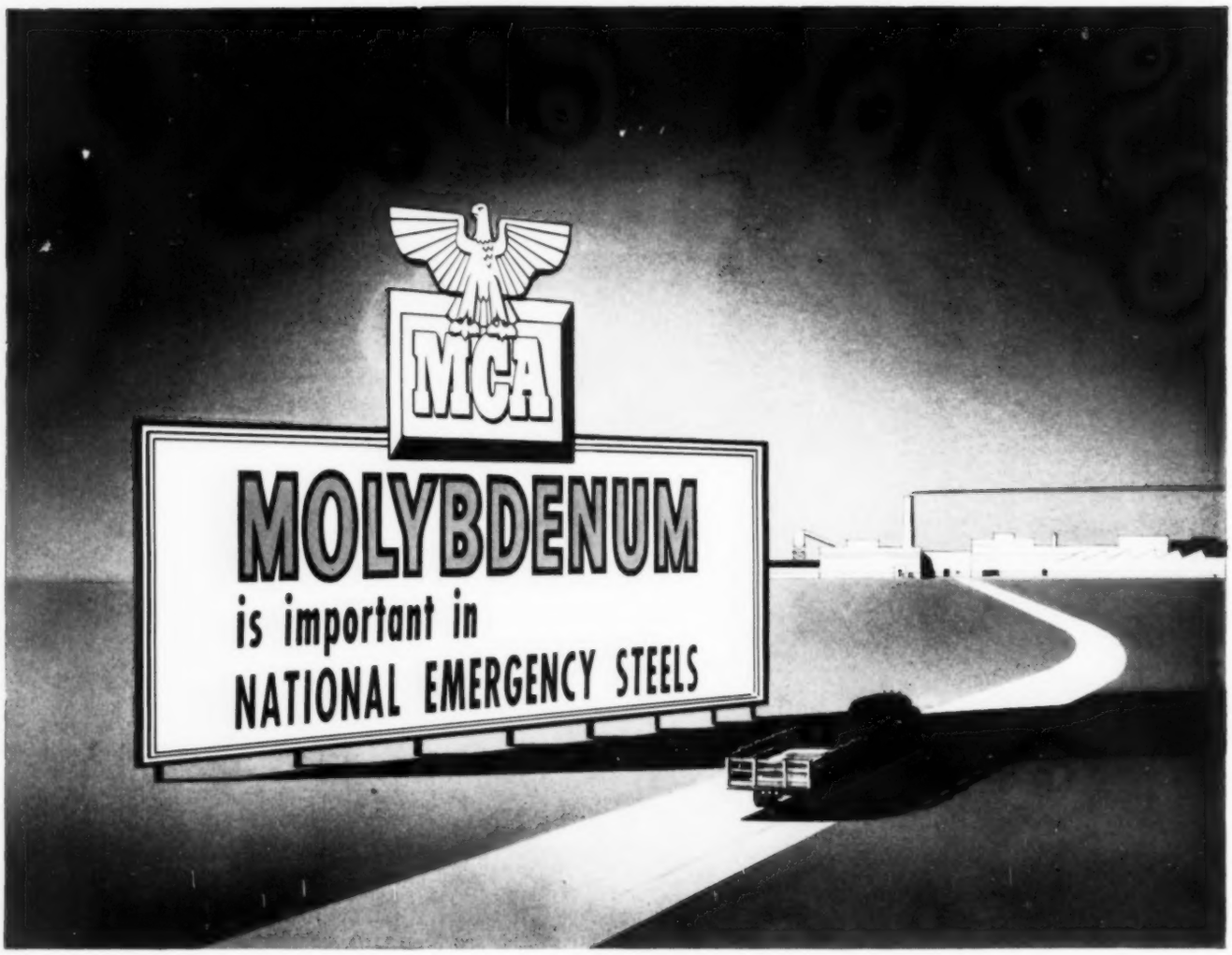


Upper left	Type PKL	Jolt, Squeeze, Power Pin Lift Machine
Upper right	Type F	Jolt, Power Turnover, Power Draw Machine
Lower left	Type AN	Air Clamp, Air Turnover, Air Draw Machine
Lower right	Type SB17	Core Blower and Type RED Machine for Clamping, Turning over and Drawing

We build 65 other types of machines — 900 different sizes

INTERNATIONAL MOLDING MACHINE CO.

2608-2624 W. 16th Street, Chicago, Ill.



National Emergency Steels have been developed to help in meeting the needs of the steel user, while conserving strategic materials as national policy demands.

The composition of these approved steels has been worked out by leading American metallurgists, pooling their knowledge and experience for the general good.

Among the elements that impart required physical properties to NE Steels, Molybdenum has an important place.

The Molybdenum Corporation of America, producer of Molybdenum, Tungsten, and Boron, invites correspondence and will gladly furnish needful data on request.

AMERICAN Production, American Distribution, American Control—Completely Integrated.

Offices: Pittsburgh, New York, Chicago, Detroit, Los Angeles, San Francisco, Seattle.

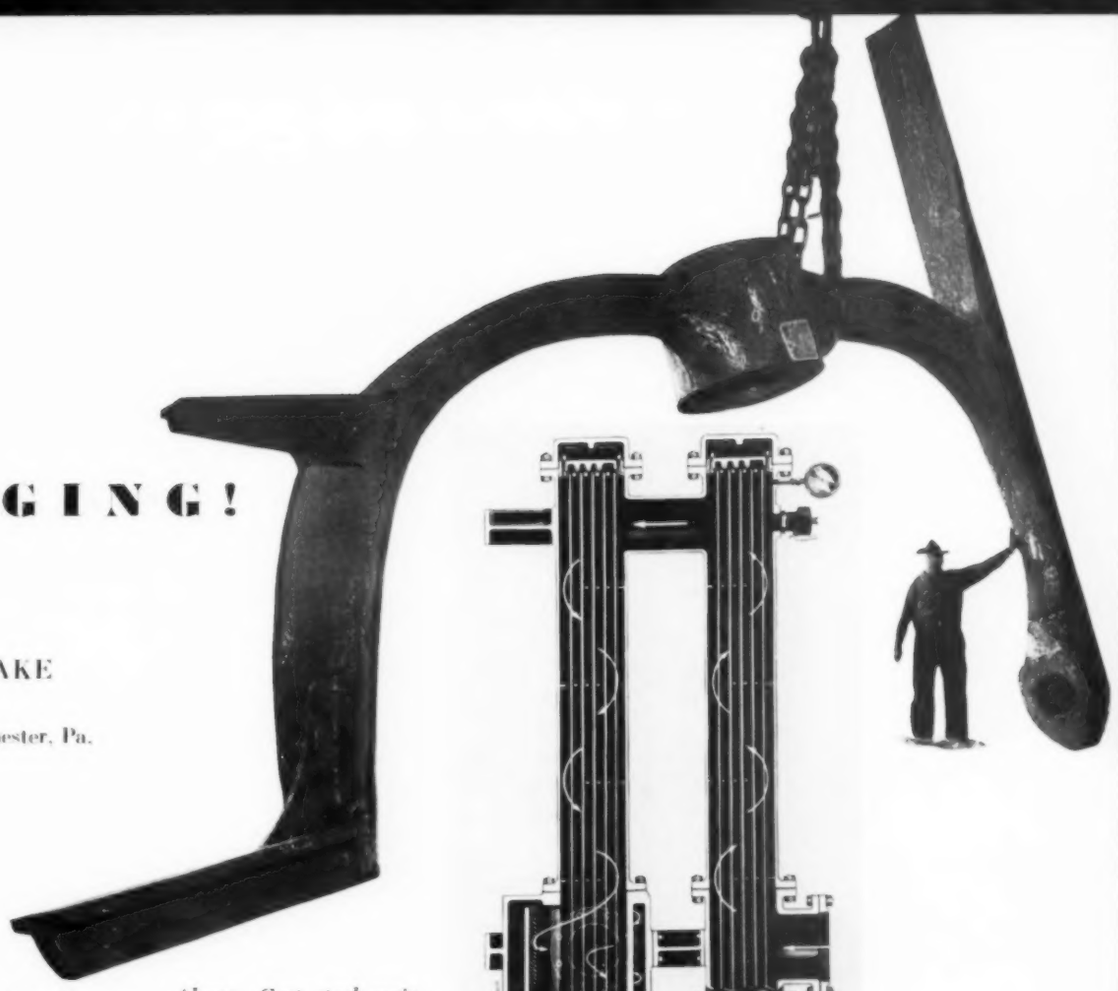
Sales Representatives: Edgar L. Fink, Detroit; H. C. Donaldson & Co., Los Angeles, San Francisco, Seattle.

MOLYBDENUM CORPORATION OF AMERICA

GRANT BUILDING, PITTSBURGH, PA.

KEEP THEM SNAGGING!

By CHESTER BLAKE
Plant Engineer
Penn Steel Castings Co., Chester, Pa.



Above—Cast steel mainstern frame weighs around 17 tons. Right—Sketch of an aftercooler

THE war effort certainly is making us all do everything possible to streamline our plants today. With the power situation as it is, we have checked up all over the place for savings. One thing we found was a simple way to keep our pneumatic tools operating, and with less air. Here's how we found that out. But, first let us give you a sketch of our situation.

Our customers build ships and are they yelling for their castings today! We specialize in marine work. Take mainstern frames for instance. They weigh 17 tons apiece and we turn them out in quantities. Casting one takes a lot of knowhow. Has to be right because it's one of the most important parts of the hull. It carries the mainshaft bearing at the propeller and the bottom rudder pin. Shaped like the letter C, it's an awkward piece to handle.

We are old hands here at Penn Steel with all sorts of odd shapes that go on a ship, like anchors and hawsepipes, and make them all the time. But everybody is in such a rush for stuff that now we have to turn them out faster than we ever did before.

Most of these castings are high tensile steel which is awfully tough metal to clean. When we start the chipping gang snagging marine parts they know they have a job of work ahead and it sure is tough on the tools.

Several years ago we installed a large water blast cabinet for pre-cleaning all our work. That was a fine idea, because all the loose sand and scale was washed off so a workman could see what he had to do, and it kept the dust down a lot. Notice how clean the air is in here? Reduces snagging time, too.

Everything in a foundry gets rough handling as you know and we didn't realize at first that wet air was causing the trouble. But that's what we discovered while we were trying to speed up our cleaning time on these big castings where the chipping hammers operate almost continuously. We began to suspect water because it kept blowing out through the tools, while they were running. It happened a lot. You could always tell by the way they lost power and sputtered.

Here at Chester, the humidity is high most of the time which accounts for the lot of water in the air, but we had never given much thought to that angle, because each time a tool started to act up, the workman would unscrew it and turn on the air which blew the water out of the hose. Then, usually before he connected up again, he would shoot a couple of squirts of oil into the tool handle, so that the whole operation took on the aspect of a lubricating job, and was let go at that.

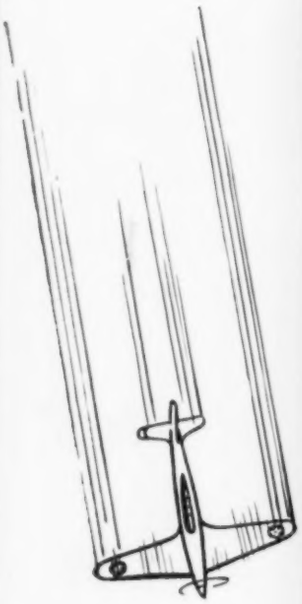
These air tools, although they get to look tough on the outside, are really very finely made precision instruments, operating at high speeds. Open one up and see how perfectly everything is made. Notice how polished steel slides on polished steel. The bearing surfaces shine like mirrors.

Now there is only one way we know to keep such tools running. That is, to keep them lubricated every moment of the time. That shot of oil in the handle every so often does not do much good if there is water in the air hose. Under the pressure, it gets mixed up with the oil to a kind of a gummy froth which doesn't lubricate, only slows up the valve action. Then a good size slug of water blows through and takes most of the oil along with it, so that there is no oil left.

You can't lubricate fine steel with water and expect it to last. If there is some fine grit in the air line, too, and there usually is, that gets mixed up with the water and causes a lapping action inside the tool, which speeds up the wear. So we figured we would have to keep that water from getting into our air tools if we were going to lick the problem. And remember, a badly worn tool will run for quite a long time, but it takes just about twice as much air to

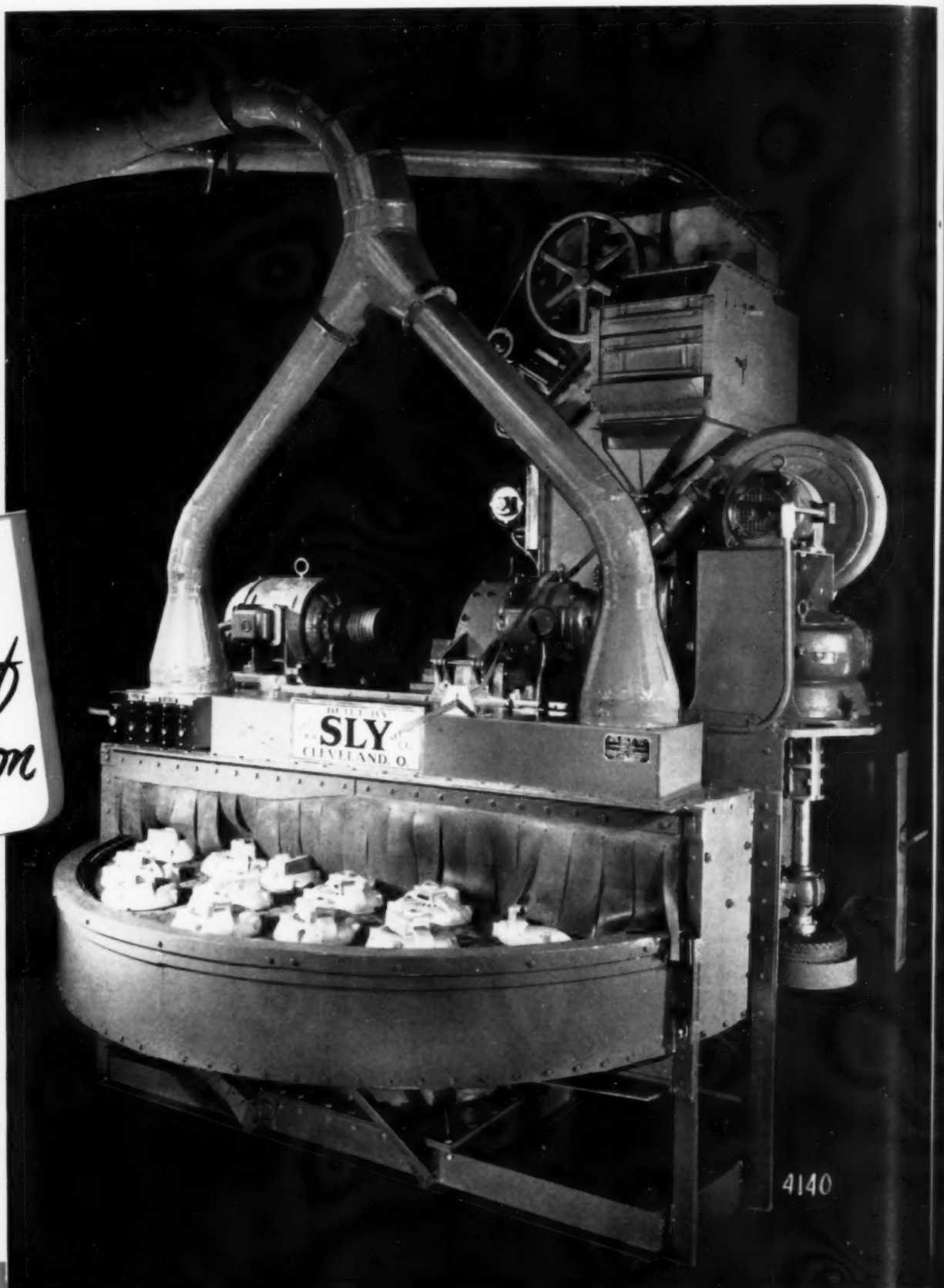
(*Concluded on page* 124)

SLY Centri-Blast (AIRLESS)



In the Battle of Production

Sly is helping set new production records by providing, from the complete line, the right kind of foundry cleaning equipment for the particular type of work to be cleaned — by providing equipment of definitely greater cleaning efficiency, which cleans better, faster and at lower cost.



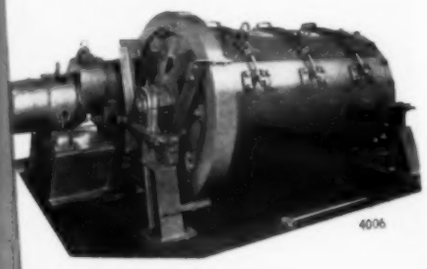
SLY AIRLESS BLAST CLEANING EQUIPMENT
MILLS AND TABLES

Exclusive wheel features for fast and economical cleaning. Typical of expressions from users is: "This machine is doing an economical job of cleaning our steel castings."

For Cleaning *Faster, Better* and at *Lower Cost*

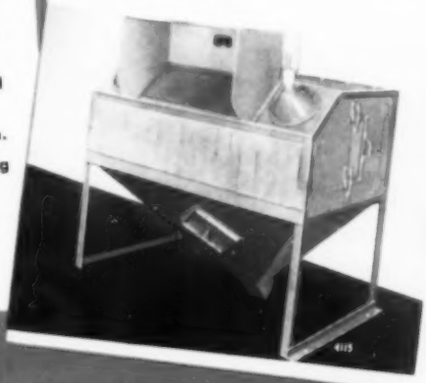
Choose from the SLY Complete Line of Foundry Cleaning Equipment

SLY TUMBLING MILLS



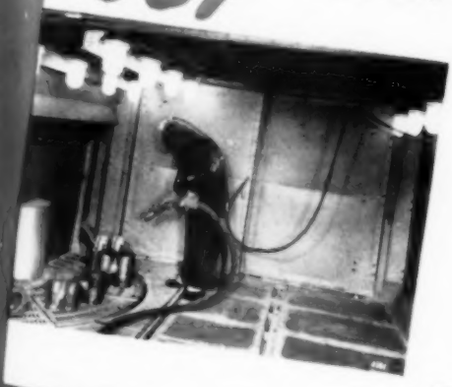
1. Heavy forged steel trunnions, extra heavy roller bearings.
2. Special door locks — easily operated.
3. Extra heavy gearhead motor.
4. Integral motor platform.
5. Loading and unloading from either side.

SLY BLAST CABINETS

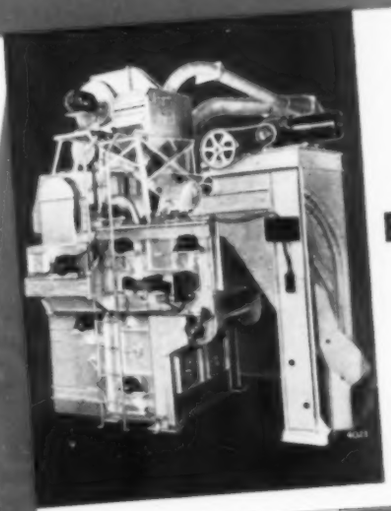


1. Two lights mounted at front to illuminate castings.
2. Operator's eyes shielded by protective hood.
3. Easy loading and unloading of castings.
4. Used for thorough cleaning of small and intricate parts, or as an auxiliary to larger units.

SLY BLAST ROOMS



1. Overall down-draft ventilation.
2. Ample illumination.
3. Lined throughout with 3-16" wear plates.
4. Floor of grating and perforated plates.



SLY AIRLESS BLAST CLEANING EQUIPMENT

MILLS AND TABLES

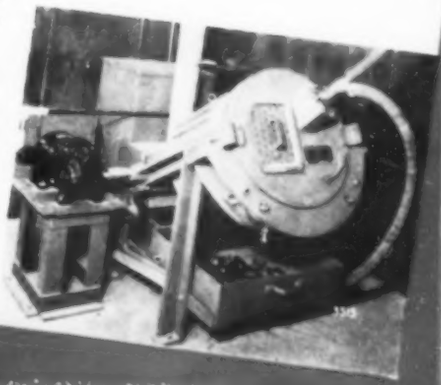
Exclusive wheel features for fast and economical cleaning.

SLY DUST FILTERS

1. More filter cloth—hence greater filtering capacity.
2. Filter bags under tension (patented) insure: (a) minimum resistance to air flow, and (b) complete dust removal.
3. Simpler shaker mechanism—less moving parts, less maintenance.
4. Bags more easily replaced.
5. Automatic control — any degree.

SLY BLAST MILLS

1. Handles quantities of castings, forgings, stampings, hardened steel parts.
2. Tilted barrel with rolling action.
3. Convex perforated bottom plate forms bottom of barrel.
4. Work is constantly turned bringing bottom pieces to top.
5. Stationary head of barrel has large door for loading.



68 YEARS OF SERVICE TO THE FOUNDRY INDUSTRY

THE W. W. SLY MANUFACTURING CO.

4753 TRAIN AVENUE ★ CLEVELAND, OHIO

(*Concluded from page* 121)

accomplish the work required.

When we really got to thinking about it, we could easily see that water was the cause of our trouble. But just what to do about it was not clear at first. We produce over 4500 cubic feet of air with three compressors. Two of these, both are two-stage machines, furnish a total of 3300 cubic feet, all of which is available for the foundry tools and similar pneumatic equipment. Then our open hearth is taken care of by a 350-cubic foot, single stage machine. Each compressor has its own air receiver and there are two auxiliary receivers in the plant. Some of our air lines are fairly long, 900 feet being about the limit. Hoses are taken off at manifolds placed at many stations throughout the plant. So you see, we have a good size air compressing lay-out.

There is, of course, no such thing as perfectly dry air, but because we are located near sea level and on the bank of the Delaware river, the air that goes into our compressors is apt to be very humid, which is probably the reason we have so much more trouble with water in our air lines than some of our friends with plants in drier locations. In hot weather, it's always worse because hot air holds more moisture than cold.

Now it's an interesting thing about compressing air, and that is; as the air becomes squeezed into smaller and smaller space the moisure in it tends to condense. It's easy to understand if you realize what happens when a large volume of humid air is compressed into a small space; say a 100 cubic feet into one cubic foot. Even if there were only one drop of water to each cubic foot when you started, at the finish there would be as much water in the final cubic foot as there was in all the 100 cubic feet at the beginning, or 100 drops of water. So you see where excess water comes from.

The temperature of the air increases when it is compressed which permits it to carry a lot more moisture than it otherwise could. Even though the water-jackets keep the heat under control, the air as it leaves the compressor is hot and carries a surplus of moisture.

Then as it is stored in the receiver and travels along the lines to do its work, the compressor keeps the pressure up even though the air cools. In cooling, the air loses its ability to hold moisture, which then condenses into water.

Install Aftercooler

We located some small drip air strainers and tried a few of them on the air lines at the manifolds. They did a good job for us, too, but the trouble was we would have needed so many of them to cover our entire system that the cost would have been high. So, after studying the situation some more, we decided to install an aftercooler at the compressor's discharge and pass the air through it before it went into the first air receiver.

This aftercooler of ours works like a charm. It's made of a nest of long tubes through which cold water is circulated. The air from the compressor is baffled around these cold tubes and becomes cool. Most of the moisture condenses right there in the aftercooler and drips off automatically and never gets into the air lines at all. So does the oily vapor picked up by the air from the compressor cylinder. It never did the rubber air hoses anything but harm so it's much better that it be removed. This outfit is fully automatic, and the only cost is for the cooling water, which is negligible. We pump all we use in the plant out of the river anyway.

Lower Repair Cost

Savings because we installed an aftercooler? Figure it out yourself. Consider 85 chipping hammers, 50 sand rammers, an assortment of grinders, molding machines, and all the other pneumatic tools and equipment you'll find in a foundry the size of ours. That's a fair bunch of stuff to keep running. Repairs have dropped by better than 50 per cent. Add to that the time saved because of fewer shut-downs, less hours for repair men, and less air used per tool and you have a sum that shows a genuine worthwhile saving.

Oh yes, one thing more! The next time you see some workmen blowing water out of an air hose, figure out how much horsepower is swishing away. It takes about 18 horsepower to compress 100 cubic feet of air a minute to the pressure used by most tools, which is 100 pounds per square inch. At that pressure, about 400 cubic feet of air a minute will escape through a standard ½-inch hose nipple such as is used on a sand rammer. That adds up to a loss at the rate of 72 horsepower. In addition to this, figure time lost, men standing around waiting for air lines to stop spouting water. Collectively, it runs into a lot of man hours. We have over 100 air tools in operation, so we hate to think about our power losses in the past, with each man blowing water off several times a day.

Completes Large Propeller Every Day

Foundry force of Koppers Co., Bartlett Hayward Division, Baltimore, is casting giant manganese bronze marine propellers for the U. S. Maritime Commission at a rate 100 *per cent greater than contract requirements. The foundry is producing* 559 *of the* 18*-foot,* 6*-inch,* 22,500 *Liberty ship propellers and* 43 *of the* 19*-foot,* 6*-inch* 35,500*-pound tanker propellers. One of these propellers is completed every work day at the foundry*

Change Meeting of Safety Council

National Safety Council, which originally scheduled its thirty-first annual convention at the Stevens hotel, Chicago, Oct. 5 to 9, has transferred the affair to the Sherman hotel, Chicago, Oct. 27 to 29. Change was necessitated by the Army having commandeered the Stevens for training purposes. In effecting the shift, the council at the same time reduced the convention from 5 to 3 days because of the war. Ned H. Dearborn, 20 North Wacker drive, Chicago, is the council's new managing director.

CARL-MAYER

... Now building three WORLD'S LARGEST VERTICAL CORE OVENS ...

for one of the most Prominent Steel Casting Companies in the U.S.A.

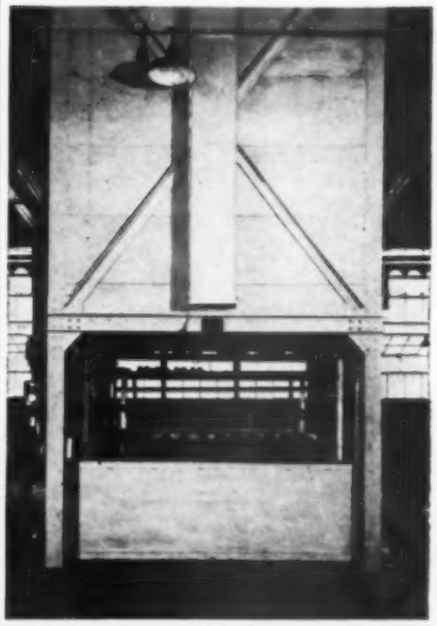
...FOR FASTER WAR PRODUCTION!

An order like this in a widely competitive field, is recognition of the character of engineering and construction that is making Carl-Mayer famous in prominent foundries, both large and small.

For more than twenty years, we have specialized on making the final core and mold making operation—baking and drying—faster, more dependable and economical and the calibre of our customers shows real achievement. Wire for a Carl-Mayer engineer!

OVER TWENTY YEARS' EXPERIENCE

Another large Carl-Mayer Monorail Type Conveyor Oven (like this) for Eclipse Aviation Magnesium Plant



Typical large Carl-Mayer Vertical Oven as installed for Electric Autolite, Fremont Foundry Co., Cadillac, General Motors and Packard Motor Co.

The Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.

A FEW CARL-MAYER CUSTOMERS

Aluminum Co. of America
American Magnesium Corp.
American Radiator Co.
Babcock & Wilcox Co.
Bucyrus-Erie Co.
Brown Industries Corp.
Dunkirk Radiator Co.
Eclipse Aviation Division of Bendix Aviation Corp.
Electric Autolite Co.
Ford Motor Co.
Fox Furnace Co.
Fort Pitt Steel Casting Co.
Frank Foundries Corp.
Fremont Foundry Co.
G & C Foundry Co.
General Motors Corp.
General Electric Co.
Gilbert & Barker Co.
International Heater Co.
Lectromelt Steel Casting Co.
Ohio Injector Co.
Packard Motor Co.
Shenango Penn Mold Co.
Studebaker Corp.
Union Metal & Mfg. Co.
Whiten Machine Works
Whiting Corp.

CORE AND MOLD OVENS

ALL TYPES . . ALL SIZES
ALL FUELS

IN ADDITION to producing enormous tonnages of castings for the war effort, it would seem that foundry employes are doing right well in the matter of buying war bonds. Numerous awards of the "Minute Man Flag" to foundries have been announced in previous issues. Now Jack Trantin, president, Youngstown Alloy Casting Corp., Youngstown, O., comes along with the good news that 100 per cent of the employes of that company voluntarily have agreed that a minimum of 12 per cent may be deducted from their pay for the purchase of war bonds. Mighty fine, Jack, and the congratulations of THE FOUNDRY gang.

Experience of the Treasury Department on the payroll savings plan for the purchase of war bonds shows that the plan is most successful when backed by a well planned promotional and selling program, tailored to the requirements of the particular company. Within a company, war bonds offer no basis for friction or dissension. No question of increased production is involved; no extra profits are made by management; wages, hours and working conditions are not affected. Every individual within a company can participate will gain important benefits—but not at the expense of each other.

—□—

Upgrading of priorities has added much to the confusion of manufacturing companies. The new set-up established by Priorities Regulation No. 12, which sets up a new series of ratings including AAA, AA-1, AA-2, AA-3, etc., recalls a previous attempt to scatter the ratings over a wider base. The first priority control established by the OPM provided for ratings A-1, A-2, A-3 etc., but before long the majority of classifications were in the A-1 group. Then an attempt was made to redistribute these ratings and the system was developed which divided the A-1 group into A-1-a, A-1-b, A-1-c, etc., before proceeding with A-2, etc. Gradually the A-1-a classification grew until it probably included 60 to 70 per cent of all priority ratings. Then the new grouping recently was established.

The same difficulties may not be repeated, since recently announced priority revisions by the WPB give the Army and Navy right of way to all critical materials. The armed services will have exclusive use of top priority ratings AAA, AA-1 and AA-2, the latter two to be treated as the same. A new rating, AA-2X has been created which is lower than AA-2 and higher than AA-3. Procedures for applying the high preference ratings have been changed by a complete revision of Preference Regulation No. 12.

—□—

The WPB is checking the operations of users of iron and steel who are subject to General Conservation Order M-126, which prohibits the use of iron and steel in the production of more than 300 articles in common civilian use.

—□—

Department of Commerce figures on malleable castings show the probable trend which will result from various restrictive orders of the WPB relating to the procurement of raw materials and the sale of castings. Production in June was 59,990 tons compared with 60,696 tons in May and 71,209 tons in June, 1941. Orders totaled 55,032 tons, compared with 54,219 tons in May and 75,075 tons in June, 1941.

—□—

Foundries recently were told that they need not file form PD-25A for metals which they desire for processing, and that they must file form PD-25A only for their purchases of metal for operating, repair and maintenance supplies exceeding $5000 a quarter.

—□—

According to supplementary Copper Order No. M-9-b, all brass and bronze foundries must have specific authorization to receive, melt, or process any copper scrap, copper base alloy scrap or ingot. To receive such authorization, application must be made on PD-59 revised and PD-123 revised to the Copper Branch, WPB, Washington. The forms must be filed with WPB by the fifth of the preceding month. If you did not get your instruction on this procedure, ask the Copper Branch.

—□—

The nonferrous foundry section of the Office of Price Administration, in addition to handling castings, is administering machined bearings and bushings and die castings. That office has adopted the policy of cataloging foundry products as castings if the machining costs do not exceed 25 per cent of the combined cost of making the casting and machining. If the cost exceeds that amount, it becomes either a bearing, bushing or a machined product. All nonferrous foundry products are regulated by price regulation 25. Machined bearings and bushings, as well as die castings, are for the present under general maximum price regulation which carries the March 1942 base date. Correspondence concerning the products outlined should be addressed to the Office of Price Administration, Temporary Building S. Seventh and Jefferson Drive, Washington,—Reference Number 673:OSM. The telephone number of Joseph B. Meier, who is in charge of the nonferrous foundry section, is Republic 7500, Extension 4197.

—□—

The war production drive, instituted six months ago by Donald M. Nelson, continues to gain momentum. War Production Drive Headquarters in Washington recently announced that individual committees in the various plants may obtain considerable help in the way of services and suggestions upon request. These include posters which emphasize *More Production*, streamers, booklets and leaflets for distribution to every employe, 16 millimeter sound films on a variety of subjects, and transcription service for use with loudspeakers throughout the plant. If your committee has not received this help, address the headquarters at once.

—□—

Crane Co., Chicago, is reported to have done an exceptional job in redesigning its line of equipment to provide substitutes for materials previously made from brass, copper, zinc, chromium, nickel, etc. For example faucets, traps and shower heads are being made of cast iron. The spud connecting the toilet bowl to the tank now is a malleable casting. Other products have been redesigned in plastics.

—□—

And, of course, congratulations and best wishes to the new Eastern Canada and Newfoundland Chapter of the A.F.A.

F. G. S.

New HOLLUP A. C. ARC WELDERS NOW READY FOR WAR WORK!

Giving You . . .

1. Perfect Arc Control
2. Fractional-Amp Adjustment
3. Reactance built into Main Transformer
4. Two Open Circuit Voltages
5. High Power Factor
6. No Magnetic Field Loss

New bulletin giving full descriptions and specifications of these new Hollup A. C. Welders sent free upon request.

Hollup Instruction Manual for A. C. and D. C. Welding. A 125 page illustrated book that includes 16 complete lessons and detailed procedures for all Hollup Electrodes. Sent postpaid upon receipt of 50c for each manual ordered.

UTILITY MODELS
Low cost Welders for the small shops. 16 heat changes . . . fiberglass insulation . . . Underwriters' Laboratories Approved.

HEAVY-DUTY
INDUSTRIAL MODELS
Available in 300-400-500 and 600 amp. sizes.

REGULAR MODELS
Available in 150-200-250 and 325 amp. sizes.

Corporation, manufacturers of welding electrodes and is a division of National Cylinder Gas Co.

NATIONAL CYLINDER GAS COMPANY

205 W. Wacker Drive — Chicago, Illinois

Offices in Principal Cities

Here's Good Wartime Production Strategy..

(1) USE CORRECT WHEELS CORRECTLY
(2) BE CERTAIN THEY ARE MADE BY
STERLING

WINNING the war is a matter of speedier production and full working schedules. Running a grinding wheel faster than its recommended speed may sometimes speed up production on a few castings, but always wears the wheel out prematurely . . . greatly lessens its number of productive hours. In the long run, nothing is gained, because sometimes there is no other wheel to take the place of the worn out one until the next scheduled shipment arrives.

Foundrymen who are beating today's tough schedules are observing two good war-winning rules: One, don't exert unnecessary pressure on the wheel, run it at recommended speeds, dress it at regular intervals, and see that the correct wheel is being used for each different job. Two, check to be certain that your wheel is a Sterling product -- one of "the wheels of industry" . . . it is a positive guarantee of speedy, quality grinding on each of your jobs.

Keep a Sterling Catalog No. 42 near at hand for quick reference. Use it to order your future wheels early, and we will see they are delivered on time. No charge for the catalog, of course!

• STERLING ABRASIVES •

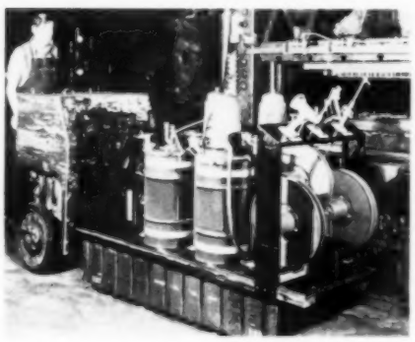
THE
STERLING GRINDING WHEEL DIVISION
OF THE CLEVELAND QUARRIES COMPANY
TIFFIN, OHIO

THE WHEELS OF INDUSTRY

new equipment and supplies

Lubricator

Stewart-Warner Corp., Alemite Division, 1800 Diversey Parkway, Chicago, has developed three new portable lubricating stations designed for mounting on hand or electric trucks. All models are supplied with air compressor or with air hose on reel for quick connection, also with shelves, racks and drawers mounted on a base 3 x 7 or 3 x 8 feet.



Outstanding features claimed for the portable station include ease of operation, one man or several can work simultaneously, convenient hose lengths for servicing hard to reach bearings, combination control valve and meter for registering amount of lubricant, outlets for high pressure and volume lubrication, facilities for handling all grades of grease, oils and slushing compounds.

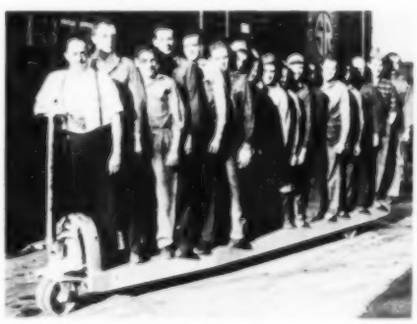
Coating Material

Coated Products Corp., Verona, Pa., is introducing a weather proof material for prefabricated metal which it is claimed replaces galvanizing and other methods and materials at present needed for other purposes. The new material,

a pitch with improved plastic characteristics, provides special climatic or weather resistant qualities to meet high or low climatic temperature conditions. The material is modified before application to prevent it from becoming brittle at low temperature, or from melting or flowing at high temperatures. It is available in various types of finishes, in a variety of colors, in fineness and quality. Economy in use is claimed through elimination of many steps formerly required in other methods.

Lift Truck

Yale & Towne Mfg. Co., Philadelphia, recently built and delivered an exceptionally long hand lift truck, 168 inches, as shown in the accompanying illustration.



The truck is a special adaptation of the company's standard hydraulic lift truck.

Melting Pots

Edwin L. Wiegand Co., 7500 Thomas boulevard, Pittsburgh, has developed new type melting pots, shown in the accompanying illustration, for solder, lead, babbitt, tin and type metal (not zinc). It is rated from 250 to 9000 watts for operation on 115,230 and 460 volts, single phase alternating current and in capacities from 10 to 950 pounds depending on the size of the pot. The smaller pots, rated 500 to 1380 watts for 115-230 volts, are heated by special ring units clamped to the crucible bottom within an insulated jacket and wired for single or three heat operation, providing a maximum safe temperature of 750 degrees Fahr. with or without temperature limiting control.

Pots rated at 3000 to 9000 watts incorporate strip heaters clamped to the crucible inside an insulated jacket to provide a safe pot temperature of 900

degrees Fahr. Automatic temperature control is necessary. Heating elements and electrical connections are enclosed to insure absolute protection, safety, and maximum pot capacity. Low radiation losses and maximum efficiency are claimed through the use of high quality insulation.

Testing Machine

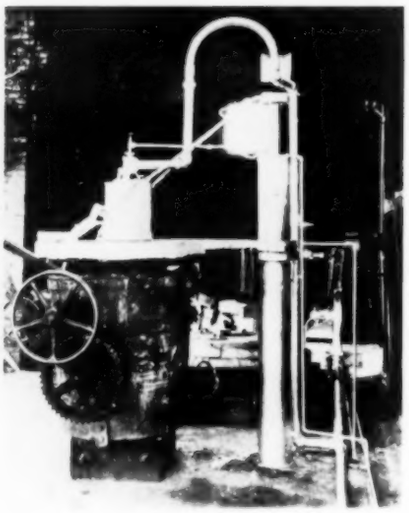
Steel City Testing Laboratory, Detroit, announces a universal testing machine in capacities from 10,000 to 100,000 pounds. The machine can be furnished for tension, compression, transverse and bending tests. It is mounted on a steel base with panel board for mounting the load indicating gages. The pulling unit is arranged so the frictional element is practically nil, which assures accurate results. Machines are supplied with motor to suit customer's requirements. The pressure cylinder is supported by two columns and the upper clamping head is adjustable through nut and worm gear drive. High capacity machines have four posts. Ball joint construction between cross head and piston permits floating of the entire pulling unit and with segmental slide assures an absolute axial pull on all specimens.

Tools and fixtures are supplied for compression, bending transverse and brinell tests.

Ladle Heater

Seeing the need for conservation of fuel and for faster heating of its ladles, a large Wisconsin steel foundry has installed new oil fired ladle heating equipment, shown in the accompanying illustration.

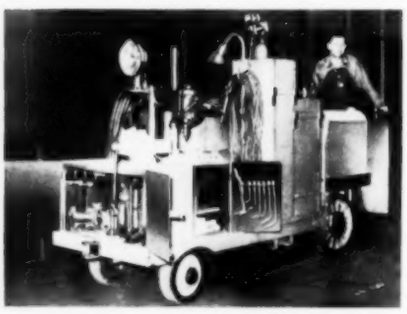
A low pressure oil burner, made by



the North American Mfg. Co., Cleveland, is mounted on a special extended combustion tile thus providing combustion efficiency, easy lighting, and proper control of the flame. All of the air for combustion is supplied through the burner by a 12 ounce turbo blower also made by that company. The cover arrangement increases efficiency and reduces the heating and handling time.

Maintenance Unit

Fisher Body Division, General Motors Corp., Detroit, recently developed the maintenance unit shown in the accompanying illustration to cope with emergencies and supplement regular maintenance equipment in taking care of breakdowns of a type that might occur under an air raid. The mobile unit is designed for clearing away debris, making repairs and serving as a temporary unit for equipment which might be damaged. It is equipped with jacks, shoring timbers, crowbars, chains, etc. Acetylene and electric welding and other equipment could do emergency duty on production lines and thus prevent work interruption. In addition to the maintenance unit a special department of the Fisher Body Division is preparing all plants for attack emergencies by the installation of fire fighting and first aid units.



Hydraulic Brake

Harnischfeger Corp., Milwaukee, will include a new type hydraulic brake in all its overhead electric traveling cranes to improve efficiency and easy maintenance. The fluid is placed in a foot operated master cylinder instead of in a separate supply tank. Other features include hard bronze bushings which permit extremely close fits, minimize play and reduce wear; alloy cast crane wheel for greater resistance to wear and scoring; swing open jaws to allow quick removal of wheel without disturbing brake-adjustment. Wear adjustments are made by turning two nuts. Removal of pins is unnecessary.

Magnifying Glass

Boyer Campbell Co., Detroit, is marketing a new model, streamlined and more compact super sight magnifying glass for first aid work as shown in the accompanying illustration. A new bracket holds a larger model where a magnifying glass with a larger field is desired and where adequate space is available. Both models it is claimed give magnification and light where they are needed. They are moved with finger tip control and remain in position. Either model is available in a choice of two bracket application. One may be mounted on a chair or table. The other is mounted on a pedestal.

Surface Plate

Delta Mfg. Co., Milwaukee, has developed a combination cast iron and plate glass surface plate, available in two sizes. The plate 15 x 18 inches weighs 135 pounds, and the 23¼ x 33¼ inches overall size, 20 x 30 inches working surface, plate weighs 360 pounds. The base is a heavy casting reinforced with ribs to eliminate any possibility of warpage. A heavy glass plate 1¼ inch thick with surface accurate to within 0.0005-inch, is mounted in the base and

cemented in place. The surface is treated to eliminate glare and reflection and permit exacting work without eye strain. It is claimed that careful tests have shown these plates stand up to rough work and retain their accuracy to a remarkable extent.

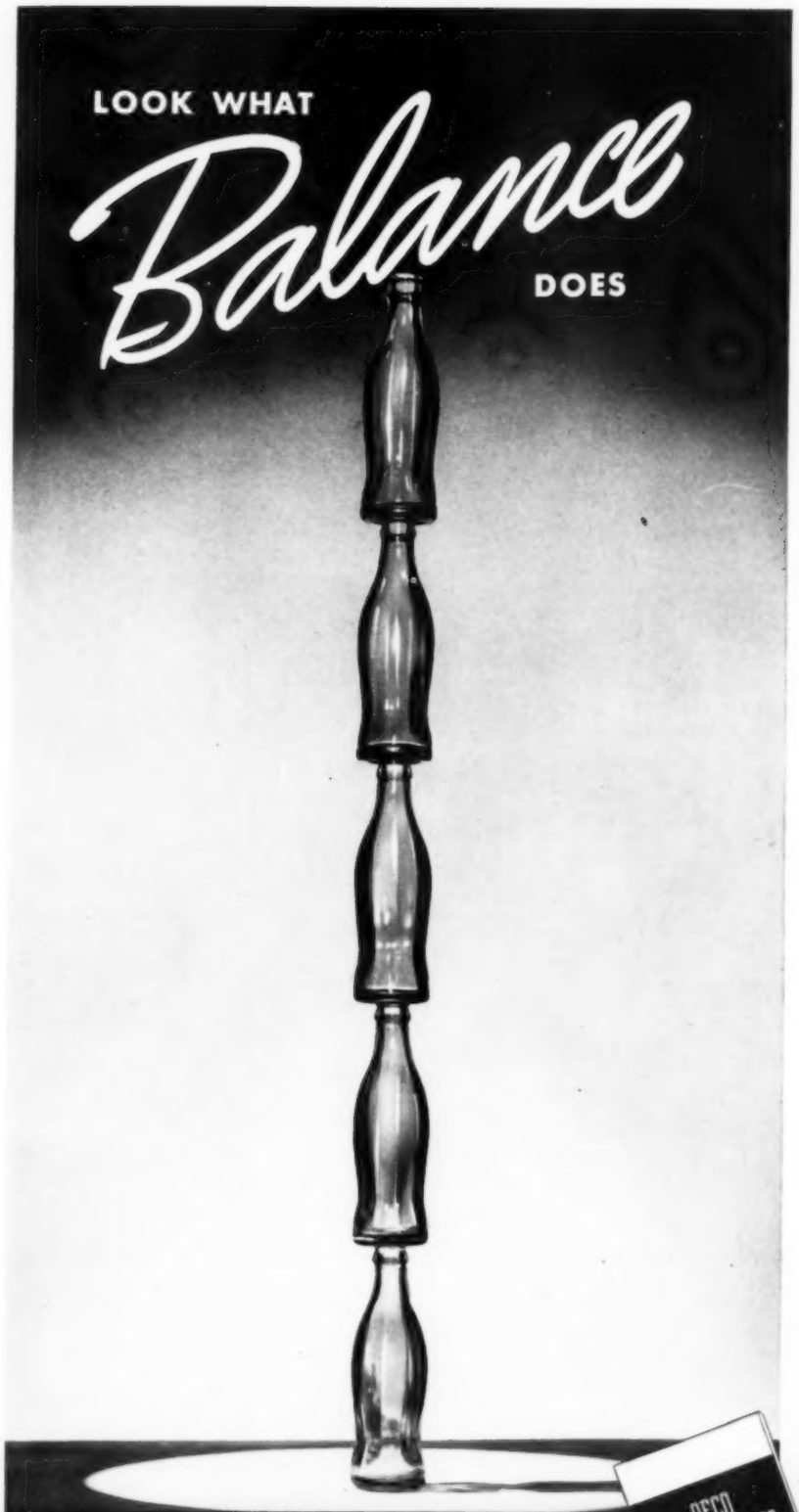
Air Clamp

Mead Specialties Co., Chicago, has made two additions to its line of air-clamps, an air clamp and a new air clamp foot control. The clamp is a variation of the drill press model adaptable to many forms of milling operations and has wide application in assembly jigs. Groups of air clamps in assembly jigs may be operated by one master valve. The clamp produces a hold down pressure four times the line pressure. With the foot control, work cycles may be speeded since the operator's hands are released. An important feature of the air clamp is the ease with which it may be set for various operations. It is claimed jigs can be reduced to the simplest forms, built in clamps and hold downs may be eliminated. Due to the flexible pressure, variations in thickness of work present no problem.

Conveyor

Standard Conveyor Co., North St. Paul, Minn., has designed a conveyor in which the V-shaped steel carriage is integral with a single strand of chain, as shown in the accompanying illustration. In this particular instance the pallets are faced with rubber to protect the finished face of the conveyed objects. Horizontal loading and unloading points facilitate transfer if necessary to other conveyor lines in the general assembly.

LOOK WHAT *Balance* DOES



AMERICAN ENGINEERING COMPANY

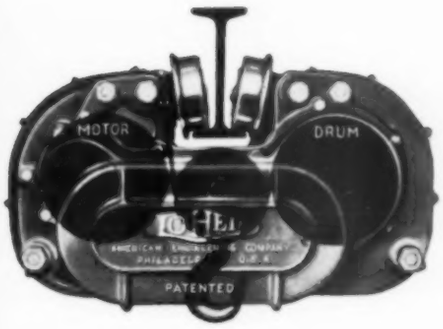
The Lo-Hed Hoist Is Applicable To Any Monorail System
There's A Balanced Lo-Hed Electric Hoist For Every Purpose

•

Look in your Classified Telephone Directory under "A-E-CO LO-HED HOISTS" for your nearest representative

•

OTHER A-E-CO PRODUCTS: **TAYLOR STOKERS, MARINE DECK AUXILIARIES, HELE-SHAW FLUID POWER**



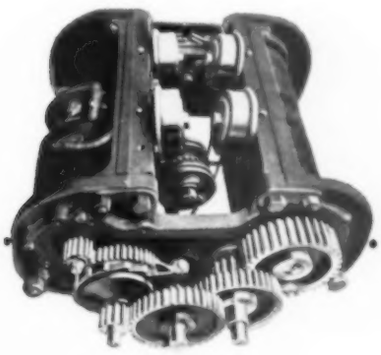
Look what BALANCE does in an electric hoist

Looking for an electric hoist that will give you years of satisfactory service after the war? Then take a look at the balanced construction of the Lo-Hed hoist—motor and drum arranged on opposite sides of the beam.

This unique construction gives you minimum headroom—a desirable plus feature for which you pay no premium. Balanced construction means much to you in dollars and reliability.

Because of balanced construction, the Lo-Hed hoist can use an efficient all-spur gear drive (sealed in oil), husky, short shafts for greater torsional strength, easily removable covers.

Along with these Lo-Hed features is everything else you want in an electric hoist—heavy duty hoist motor, ball or roller bearings, automatic holding brake, 100% positive automatic upper limit stop, fire, dust and moisture proof controller, and precision machining. Buy the hoist that will last longer—Lo-Hed. Ask for the complete catalog of Lo-Hed Hoists.



AMERICAN ENGINEERING COMPANY
2418 Aramingo Avenue, Philadelphia, Penna.

☐ Please send me your complete catalog of LO-HED HOISTS
☐ Ask your representative to get in touch with me promptly

Name _____

Company _____

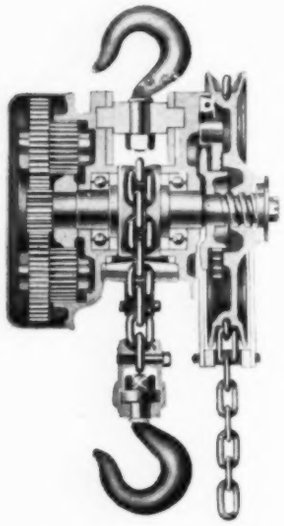
Street Address _____

City _____ State _____

(Please Print Plainly)

Chain Hoist

Coffing Hoist Co., Danville, Ill., has developed a standard type, spur geared, chain hoist, shown in the accompanying illustration. The hoist is equipped with



a dust guard to protect the brake. Heavy suspension plates provide support between top hook crosshead and load sheave. The plates also directly support the saddle for the double chain hookup, claimed to be an entirely new feature in this type hoist. Elimination of a top yoke is said to reduce weight and head room and permit the hoist to hang evenly at all times. The load sheave is mounted on two heavy precision ball bearings, enclosed and protected from dust and dirt. Hoists are available in six sizes ½, 1, 1½, 2, 3 and 4 tons lifting capacity.

Locomotive

Atlas Car & Mfg. Co., Cleveland, recently developed a new 65-ton diesel-electric switching locomotive. Each truck is a complete unit with two driving motors, fully equalized brakes and sander equipment. Pullman type equalizers give full spring mounting. Atlas type drives are cast steel. Complete drive is fully enclosed and mounted on the axles with roller bearings and spring suspended to give the desired three point support. Steel gears are totally enclosed and lubricated from a central reservoir. The drive is equipped throughout with antifriction bearings.

Plant Heating

Carrier Corp., Syracuse, N. Y., recently has installed 10 heat diffusers in the foundry of the American Magnesium Corp. These units supply 135,000 cubic feet of outside air per minute and are said to maintain comfortable working conditions.

The heating units are 9 feet above floor level and are mounted in an inverted position along the side walls. From long slotted outlets, a low velocity flow of outside air is fanned downward and toward the center of the floor at the correct temperature to offset heat losses through the ventilators. One of the advantages claimed for the system is that overblows, which swirl dust and other impurities around the foundry without forcing them toward the ventilators, are eliminated by discharging the air at low velocity.

Hand Guard

Industrial Gloves Co., Danville, Ill., has developed what is claimed to be a sturdy, comfortable, long wearing hand guard made of tough chrome tanned cow hide reinforced on the back where the wear comes, with extra patch of leather and with steel. The guard is of the mitten type open at end to give free use of the fingers. May be worn over regular glove or mitten. Available in pairs, all lefts, all rights, or in any other combination. Seams are stitched with steel thread to make the guard practically rip proof.

Blackout Awning

Ackling Stamping Co., Toledo, O., has designed a metal blackout awning as shown in the accompanying illustration. For ordinary use and sunlight protection

the awning may be lowered half way, all the way for blackout protection. The awnings are said to be rust proof and fire proof and can be secured if necessary with an inside lock. They are available in several neutral nonglare colors.

Vibrating Screens

Robins Conveyor Belt Co., 270 Passaic avenue, Passaic, N. J., has introduced a new line of vibrating screens in a wide variety of sizes and in three principal styles. The first is mounted on a permanent base on the floor. The second is suspended from an overhead support and the third, known as a contractor's screen, is provided with a supporting frame which incorporates an adjustable yoke permitting the slope to be changed for maximum efficiency for each job. In each model the sharp vibrating action is produced by adjustable counter weighted arms. Loss and contamination of oil is prevented by double bronze centrifugal flingers. Screen cloth panels are rubber cushioned and maintained under arched transverse spring tension. Cloth is kept drum tight. Replacement is made easy through short interchangeable sections. The screen is driven by a one-horsepower motor mounted on whichever side is more convenient for operation.

Light Grinder

Hammond Machinery Builders, Inc., Kalamazoo, Mich., recently has placed on the market a new, compact unit for tool and light grinding with self contained dust collector inside the base. The only parts outside are the fan motor, connecting pipes from wheel guards, and exhaust vent guard. Lighter particles and air pass through three fiber glass filters while the heavier particles drop to the bottom of the filter housing. The fan is mounted on the fan motor shaft. One switch starts and stops fan and grinder. These compact units, it is claimed may be placed close to walls or in line, back to back with room for filter replacement. The collector also is available as a separate unit for use with other types of grinders.

Belt Idler

Chain Belt Co., 1600 West Bruce street, Milwaukee, has developed a new self-aligning idler for flat conveyor belts. Running to one side the belt has a tendency to swivel the idler in a horizontal plane. If this is not sufficient to cause the idler to swing enough to force the belt to throw back immediately, the belt will continue traveling to one side until it contacts the counter-weighted end disk. This throws the idler out of line and forces the belt to swing back. Where, for any reason excessive misalignment of a conveyor belt exists, it is claimed these self-aligning idlers, spaced at intervals between the stationary idlers, automatically bring the belt back to central position. Antifriction bearing belt idlers are available in type and size for every belt need.

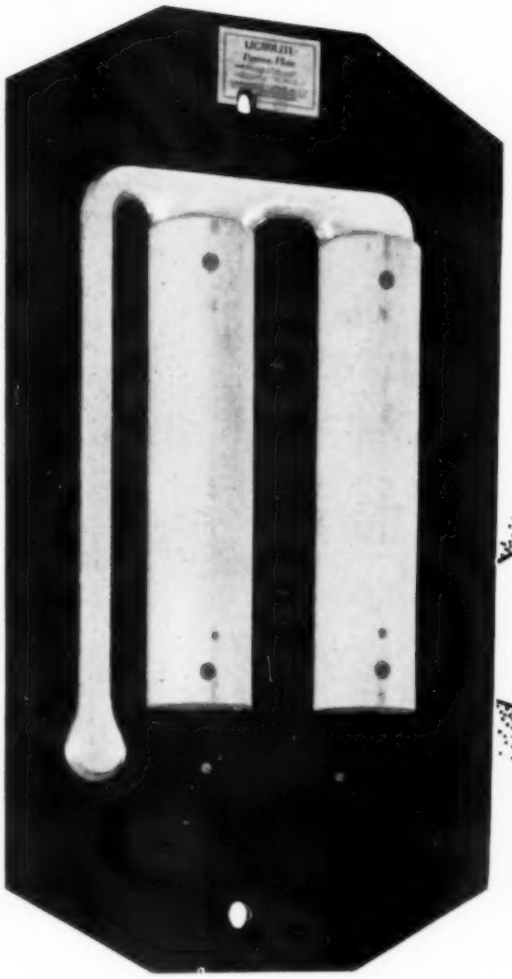
Holding Magnet

Stearns Magnetic Mfg. Co., 662 South Twenty-eighth street, Milwaukee, has designed a holding magnet or welding clamp for use in welding operation where it is claimed it draws and holds plates together more readily and accurately than where the same purpose is accomplished by hand or by mechanical means. With the new device the plates are drawn to a level alignment flush against the surface of the magnet. By tack welding the plates on either side of the magnet the welder can maintain this alignment. The magnet is available in several sizes including one 10 inches in

(*Continued on page* 134)

LIGNOLITE

Pattern Plates
Cope & Drag Boards



1/2 THE WEIGHT OF ALUMINUM

NON-CRITICAL

•

IMMEDIATE SHIPMENT

AN EXTREMELY TOUGH LIGNIN PLASTIC

- Easily machined, sawed, drilled, tapped, etc.
- Impervious to moisture, oil, grease, dilute acids.
- Uniform caliper and non-warping.
- Abrasion proof and non-slip surface.

STANDARD SIZES—HOW TO ORDER

Available in all flask sizes 7/16" to 2" thick or in 46" x 46" size for own cutting—Plates are octagonal shape with 1" allowance for flask and 2-1/2" allowance for ears. Order by flask size and specify thickness.

Write for sample and complete information

CARRIED IN STOCK & DISTRIBUTED BY:

ADAMS & NELSON COMPANY
4125 Fullerton Avenue
Chicago, Illinois

M. A. BELL COMPANY
217 Lombard Street
St. Louis, Missouri

FREEMAN SUPPLY COMPANY
1152 East Broadway
Toledo, Ohio

GRANT & COMPANY
2144 East 7th Street
Los Angeles, California

INDUSTRIAL SUPPLY CO.
2309 Adeline Street
Oakland, California

GEORGE F. PETTINOS, INC.
1206 Locust Street
Philadelphia, Penna.

WATERSTON'S
28 East Larned Street
Detroit, Michigan

WESTERN FOUNDRY SAND CO.
1039 Elliott Avenue, West
Seattle, Washington

In Canada:

GEORGE F. PETTINOS, (CANADA) LTD.
42 James Street South
Hamilton, Ontario

MARATHON CHEMICAL COMPANY

DIVISION OF MARATHON PAPER MILLS COMPANY

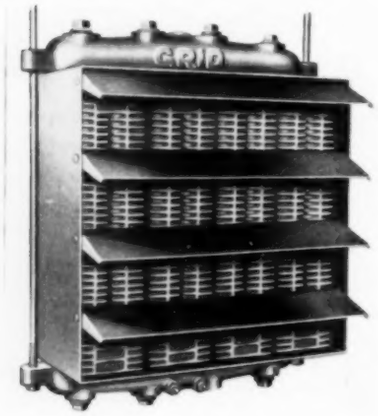
ROTHSCHILD **WISCONSIN**

(*Continued from page* 132)

diameter, weight approximately 70 pounds, operating from 40 to 60 volts direct current and exerting a pull of 2000 pounds on ¾ or 1-inch steel plates.

Unit Heater

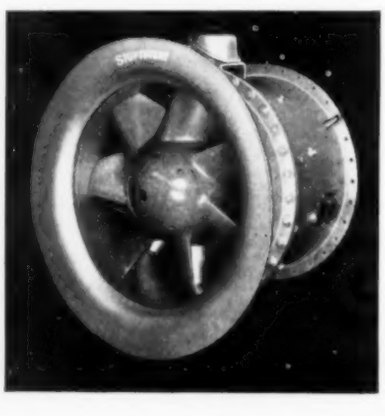
D. J. Murray Mfg. Co., Wausau, Wis., is producing unit heater with cast iron heating sections instead of aluminum heating sections in co-operation with



the war effort. The new heater is engineered along similar lines as the aluminum heating sections, and engineered and constructed to withstand up to 250 pounds steam pressure. The cast iron unit is free from electrolysis since only one type of metal comes in contact with steam or hot water.

Ventilating Fan

B. F. Sturtevant Co., Hyde Park, Boston, has introduced a new axial flow type fan. Features claimed include: Mechanical efficiency over 90 per cent; quiet operation; comparatively small size; light weight; compactness. Pressures range from ½ to 6 inches water gage for the motor driven ventilating fan. Other designs with turbine drive operate against pressures up to 60 inches water gage. Motor driven units are adapted to 1160 and 1750 standard speed motors. Turbine driven units operate at speeds as high as 5000 revolutions per minute. The fan is produced in a wide range of sizes and volumes.

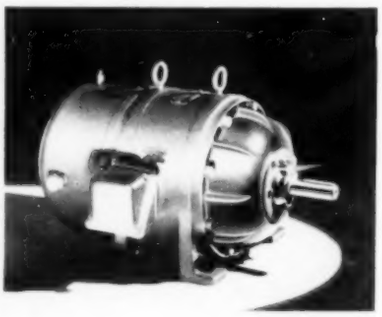


Welding Fluxes

A new line of welding fluxes for both ferrous and nonferrous metals and alloys has been developed by the National Cylinder Gas Co., Chicago. Type No. 1 for welding cast iron is designed to float the heavy oxides to the surface and keep them liquid during welding so that a dense, ductile weld may be secured. Type No. 2 for brazing cast iron is said to produce a good bond at low base temperature. Type No. 3 is suitable for brass, bronze, copper, steel and malleable iron and is claimed to reduce atmospheric oxidation and keep flux glaze at a minimum so that the bronze deposit remains clean and bright. Type No. 22 is for sheet and cast aluminum and its alloy and provides a fast and effective fluxing action to float out oxides and impurities.

Induction Motors

General Electric Co., has introduced a new line of polyphase induction motors in sizes from 1 to 20 horsepower suitable for use under magnesium dust conditions for class 11, group *E* locations. Design of the new line of motors is based on a series of tests recently initiated by that company, at the Underwriters' Laboratories Inc., in which a sample



15-horsepower motor running at 1800 revolutions per minute was subjected to a cloud of fine magnesium dust while operating under heating and cooling cycles simulating several years' operation in an industrial plant. It is claimed that careful examination of the motor after the tests indicated that it had successfully withstood all tests.

Air Compressor

Schramm, Inc., West Chester, Pa., has developed a semiportable air compressor with special skids and lifting bail, shackle bolt fittings attached to frame, removable wood skids for mounting on chassis, trailer, truck or base. Unit can be lifted by crane, hoist or man power for truck or mobile power installation. Capacity is stated to be 60 cubic feet air delivery per minute at 100 pounds gage pressure. With a Mercury V-8 engine, four cylinders are used for power and four cylinders for compressing air, thus eliminating belts, chains, gears or other forms of transmission. Other features of this self-contained unit include electric self starting, air and fuel tanks, cooling unit, hood and doors, force feed lubrication, block construction, positive automatic control, mechanical intake valves, low fuel consumption and light weight portability.

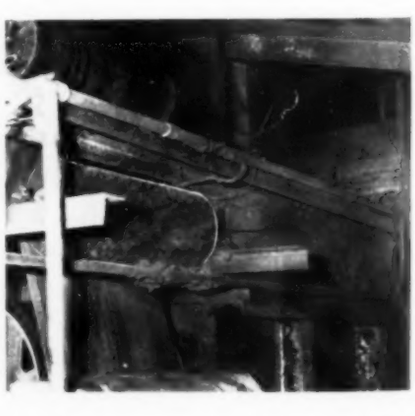
Brushes Sand From Conveyor Belt

In a midwest malleable iron and steel casting foundry, nine specially constructed rotary power driven brushes, staple set type, and made by the Osborn Mfg.

Co., Cleveland, aid production efficiency by keeping sand conveyor belts clean and at the same time help improve working conditions by preventing carry over loose sand from falling on the men working underneath.

Directly under the drive pulley of each belt the power brush rotates in the direction opposite to that of the belt. All nine brushes operate 16 hours per day until the fibers are worn down. The system has been in use for 5 years with the average effective life of each brush 3 to 4 months.

The brushes readily are mounted on the conveyor system where a metal axle goes through the wood core of the brush. Each unit driven by a belt powered from the head pulley has a tension spring adjustment to give it the proper brushing pressure at all times.



COMBAT CLIMBING COSTS

THE surest and best way to increase profits has always been by reducing costs; with the advent of price ceilings, it becomes almost the *only* way to do it.

The three items shown and described on this page are geared to that end—cutting your costs, and foundries from coast to coast are proving it!

All three will help you to increase production and cut costs—they'll help you to help us win this war!

★

FEDERAL LOWE ELECTRIC SIFTER

The streamlined riddle for faster sifting.

The new Lowe Electric Sifter has a redesigned yoke—which has multiplied the action of the screen. The result is a faster sifting action than ever before plus a more aerated sand.

The lower bearing of the Lowe has been streamlined to allow more shovel clearance, which permits faster loading.

The sifting action of the Lowe is still the powerful gyro-vibratory action—exclusive with the Lowe.

Replaceable bearings, well protected from sand and dirt; a powerful ball-bearing totally enclosed motor, both insure a long trouble-free life for the Lowe Electric Sifter.

FEDERAL TWISTED STEM CHAPLETS

"The Twist Does The Trick"

1. The twisted shape promotes keying action by presenting four sharp fusion edges.
2. The streamlined design offers no place for dust and dirt to collect—will not trap gases.
3. Uniform thickness from head to head—no thin sections to prematurely burn-in.

Electrically welded heads make the Federal Twisted Stem Chaplet one solid piece.

The ideal chaplet for all castings, large, small or pressure. Made in stem sizes from ⅛" to 1" square in all lengths.

THE CLIMAX WIRE STRAIGHTENER

If your scrap heap contains used core wires and rods, it's a gold mine for you!

Hundreds of foundries, like the one shown here, are straightening those wires with a Climax Wire Straightener—not just once, but over and over.

The Climax makes used wires worth the same as new ones.

The Climax comes in three models, each of which handles several different wire sizes. One model will usually straighten all the sizes you use. The wire you save will quickly pay for the Climax. Why not get details and prices now?

★ ★ ★

THE FEDERAL FOUNDRY SUPPLY CO.

4600 EAST 71st STREET, CLEVELAND, OHIO

CHICAGO — CHATTANOOGA, TENN. — DETROIT — MILWAUKEE — MINNEAPOLIS — NEW YORK — RICHMOND, VA. — ST. LOUIS — UPTON, WYO.

activities of foundry groups

Southern California

MEMBERS of the Southern California Chapter of the A.F.A. knocked off work early Saturday, July 25, to attend the chapter's annual outing at the Lakewood Country Club, Long Beach, Calif. Ticket sales were far above expectation with an attendance of some 600. Those able to come early enjoyed golf, horseshoe pitching, baseball and other various feats of strength. Songs led by Pete Valentine of Del Monte Properties with his accordian furnished the highlight of the afternoon.

The banquet, presided over the chapter's president, Earl Anderson, Enterprise Iron Works, Los Angeles, was not only one of the finest the chapter has held to date, but the largest, due mainly to the increased interest in A.F.A. activities by the nonferrous producers and the inspection division of the War Department.

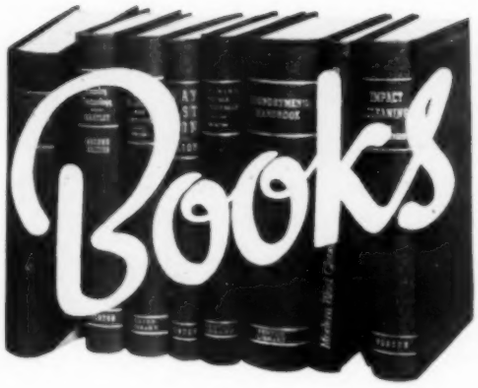
More than 600 members and guests were present at the summer party held by the Southern California Chapter of the A.F.A. at Lakewood Country Club on July 25

Dick Hughes, entertainment chairman, passed plenty of money around with more than 25 prizes of defense stamps and cash; and to wind up the affair, he presented 20 acts of Hollywood entertainment.—*E. M. Hagener, secretary.*

E. Canada - Newfoundland

AN ENTHUSIASTIC group of members, numbering more than 80, gathered at the Queens Hotel, Montreal, Que., Canada, on July 23, to organize the twenty-third chapter of the A.F.A.

(*Continued on page* 138)



FOR MODERN FOUNDRYMEN

■ Modern foundry management and practice requires that foundrymen be "on their toes" to meet the demands of industry...The PENTON BOOKSHELF of instructive and informative books on all phases of foundry management and practice will help you as it has already helped thousands of other foundrymen. Select those volumes that you need now and order copies today . . . post this advertisement on your bulletin board for the convenience and information of your co-workers. A study of the pages of these books will almost immediately lead to improved efficiency and practice in your shop.

TALES FROM THE GANGWAY

450 pages, 59 chapters, $1 postpaid. This book is a collection of the early chapters of Pat Dwyer's rollicking foundrymen, told in an exceedingly readable style. As practical as it is readable, this book tells the foundryman many practical things, including: the making of gears, open sand plates, sheave wheels, large pots, blast furnace coolers, winding or hoist drums, patterns, stand pipe connections, long columns; core-making, etc. Originally sold for $3, this book is filled from cover to cover with down-to-earth, practical suggestions. If there is a foundryman who does not already have this book he is missing one of the most readable and usable books ever written.

ELEMENTARY FOUNDRY TECHNOLOGY
Revised Third Edition

377 pages, 132 illustrations, 16 tables, $3 postpaid. Revised and with a completely new chapter on malleable cast iron, this long recognized standard book on foundry practice sponsored by the National Founders Association, Chicago, thoroughly covers all phases of foundry practice and procedure. Subjects include: Elements of Iron, Iron Manufacture, The Cupola and Its Operation, Elementary Problems in Steel Foundry Production, Brass Melting, Foundry Sands, Gates and Risers, Molding Machines, Core Machines, Long Life Molds, and Malleable Cast Iron Foundry Practice. This book is ideal for both apprentices and practicing foundrymen.

MODERN BLAST CLEANING AND VENTILATION

213 pages, 38 illustrations, $4 postpaid. This book, by C. A. Reams, engineer of Ford Motor Co., brings latest and most approved methods of casting cleaning to foundrymen in plain language. It is full of completely practical suggestions and proved methods and practices. Application of cleaning methods discussed will eliminate many objectionable cleaning room practices. Full information on abrasive selection and use is included. Practical foundrymen report this book worth many times its cost.

GRAY CAST IRON

383 pages, completely illustrated, $5 postpaid. John W. Bolton, recognized foundry authority has collected and compiled in readable form all recent information on this subject, so presented that it is extremely usable. Includes latest information on structural metallurgy; engineering and physical properties, melting processes; casting defects; effects of regular and alloying elements; superheating; heat treatment; machinability and wear; effect of temperature on mechanical properties; corrosion, and specifications. This book is a "must" in every progressive gray iron foundry.

FOUNDRYMEN'S HANDBOOK

310 pages, fully illustrated, $3 postpaid. This book, reduced from $6 because some specifications are now out of date, has long been a standard reference book among foundrymen. It is a complete compendium and handbook covering every branch of foundry work from estimating the price to cleaning finished castings. If you do not already own a copy of "Foundrymen's Handbook" your working tools are incomplete.

IMPACT CLEANING

480 pages, 256 illustrations, $7 postpaid. Wm. A. Rosenberger is a recognized impact-cleaning engineer who has gathered together all important information on the subject and presented it in readily understood form. Every foundryman knows that cleaning costs can eat up profits. This book shows both theoretical and practical ways to reduce cleaning costs to a minimum. It presents the "how and why" of high cleaning costs and shows exactly the methods to be used in their reduction. No foundryman responsible for either quality production or satisfactory earnings should be without this book.

GATES AND RISERS FOR CASTINGS
New Edition

373 pages, fully illustrated, $4 postpaid. This is a practical book covering completely and with authority a subject never before covered in book form. It is an encyclopedia of sound foundry practice supplying reliable answers to the ever present question, "How can casting defects be prevented?" Written for every foundryman from workman to owner.

For convenience in ordering, use the coupon below . . . be sure to check all the books you want.

AMERICAN MALLEABLE CAST IRON

416 pages, 190 illustrations, formerly $7, NOW $2.50 postpaid. This book by H. A. Schwartz, completely covers history of the industry—its development, modern methods of manufacture, metallurgical principles involved and properties and uses. Also included is a detailed list of all important books and articles on the subject to date of publication. Written primarily for the producer and user of malleable castings, this book is also well adapted to needs of technical students and libraries.

MELTING IRON IN THE CUPOLA

240 pages, 126 illustrations, $2 postpaid. This book formerly sold for $5. Covers practically every phase of cupola construction, operation and maintenance. A thoroughly practical book. Suitable for the novice studying the cupola as well as the practical foundryman who operates it. Tables, formulas and a complete cross-index listing more than one thousand items makes this a valuable reference and practical work book.

THE FOUNDRY, Book Department,
1213 W. Third St., Cleveland, Ohio

Enclosed is $.....* ☐Check; ☐Money Order; ☐ Company Order; for the following books I have checked.

- ☐ **"Elementary Foundry Technology" @ $3 postpaid**
- ☐ **"Gates and Risers for Castings," @ $4 postpaid**
- ☐ **"Gray Cast Iron," @ $5 postpaid**
- ☐ **"Modern Blast Cleaning and Ventilation," @ $4 postpaid**
- ☐ **"Impact Cleaning," @ $7 postpaid**
- ☐ **"Foundrymen's Handbook," @ $3 postpaid**
- ☐ **"Melting Iron in the Cupola," @ $2 postpaid**
- ☐ **"American Malleable Cast Iron," @ $2.50 postpaid**
- ☐ **"Tales from the Gangway," @ $1 postpaid**

NAME .....

ADDRESS .....

CITY ..... STATE.....

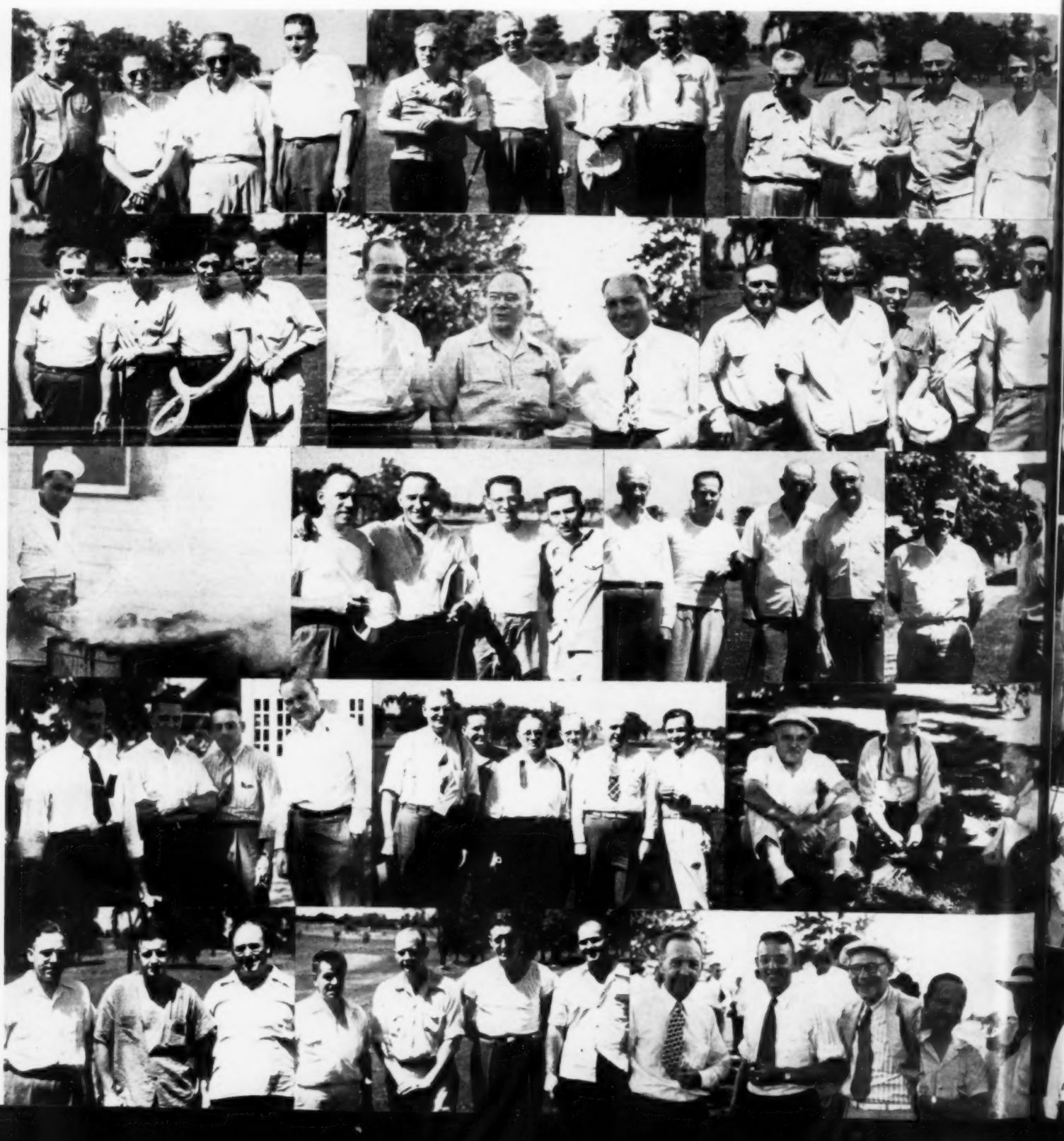
*Orders for delivery in Ohio must be accompanied by 3% additional to cover compulsory state sales tax.

(*Continued from page* 136)

to be known as the Eastern Canada-Newfoundland Chapter.

The meeting was organized by a local committee under the chairmanship of Robert W. Bartram, president, Robert W. Bartram Co. Ltd., Montreal, and was opened by him. He explained the purposes of the proposed chapter and gave some of the history connected with the development of the meeting. He called upon Harold J. Roast, a director of the A.F.A. and vice president, Canadian Bronze Co. Ltd., Montreal, who had been appointed chairman of a nominating committee. Mr. Roast presented the following as nominees: Chairman, Charles C. Brisbois, foundry superintendent, The Robert Mitchell Co. Ltd Montreal; Vice Chairman, M. L. Doelman, general manager, Electric Steels Ltd., Cap de la Madeleine, Que.; Secretary-Treasurer, Andrew R. Webster, vice president, Webster & Sons Ltd., Montreal. Directors nominated to serve 1 year: Lawrence L. Cohen, manager, W. R. Cuthbert & Co. Ltd., Montreal, William Casey, president, Canadian Locomotive Co. Ltd., Kingston, Ont.; George Beaton, shops superintendent, Dominion Steel & Coal Co. Ltd., Sydney, N. S.; H. W. Downs Jr., vice president, Union Screen Plate Co. of Canada Ltd., Lennoxville, Que.; directors to serve 2 years: William G. Burgess, superintendent, Jenkins Bros. Ltd., Montreal; William Campbell, works manager, T. McAvity & Sons Ltd., St. John, N. B.; Ernest G. Jones, superintendent,

Wisconsin Chapter of the A.F.A. held its seventh annual summer outing at Ozaukee Country Club, Milwaukee, July 17. Photographs by John Bing, A. P. Green Fire Brick Co., Milwaukee



Sorel Industries Ltd., Sorel, Que.; W. C. Perrot, foundry superintendent, Canada Iron Foundries Ltd., Three Rivers, Que.; directors to serve 3 years: G. Ewing Tait, metallurgist, Dominion Engineering Works Ltd., Lachine, Que.; Emile Drolet, president, La Cie F. X. Drolet Limitee, Quebec, Que.; R. Bernard, president, La Cie J. A. Gosselin, Limitee, Drummondville, Que.; E. N. Delahunt, superintendent, Warden King Ltd., Montreal. Other nominations were invited from those present and since no additional nominations were made, the report of the nominating committee was accepted and those nominated declared unanimously elected.

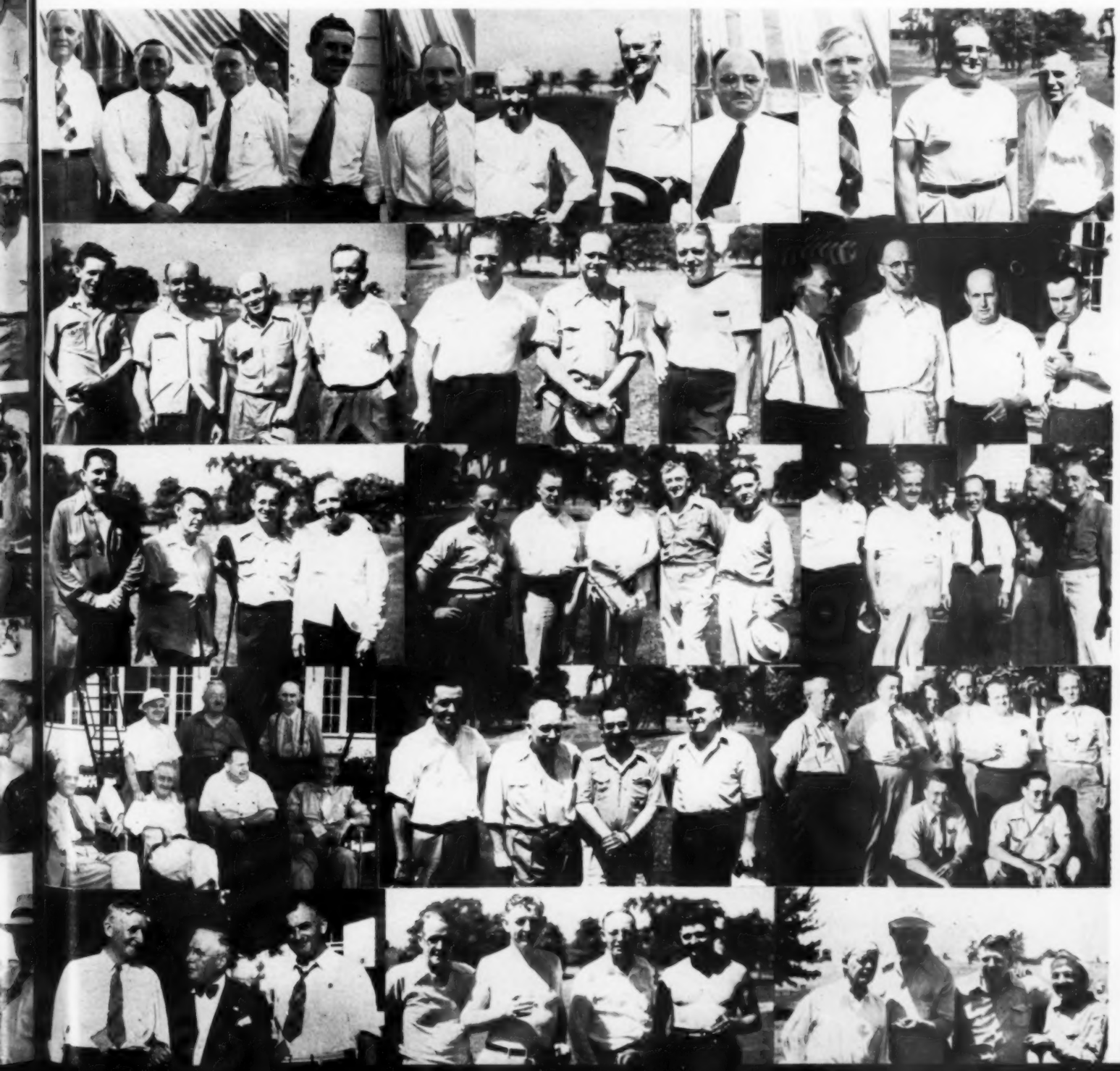
Mr. Bartram then introduced the newly elected officers and directors who were present and asked Mr. Brisbois to address the gathering as the newly elected chairman. Mr. Brisbois modestly greeted the chapter membership and pledged his best efforts to make the chapter a decided success, and requested the co-operation of the members with himself and the other officers and directors. He repeated his address in French for the benefit of the French speaking membership and was heartily applauded.

Robert E. Kennedy, secretary of the A.F.A. then was introduced. Mr. Kennedy gave a short talk on the history and activities of the A.F.A. Other special guests also were introduced, including G. W. White, Toronto, who is secretary of the Ontario Chapter. The evening was concluded with a buffet supper provided by some of the local members.

Northeastern Ohio

APPROXIMATELY 150 members and guests attended a special meeting of the Northeastern Ohio Chapter of the A. F. A., July 30, at the Tudor Arms, Cleveland, to discuss the various forms which foundrymen and their customers are called upon to submit to government

Members and guests of the Wisconsin Chapter of the A.F.A. enjoyed foundry furlough on July 17 at the Ozaukee Country Club, Milwaukee. Photographs courtesy of John Bing, A. P. Green Fire Brick Co., Milwaukee

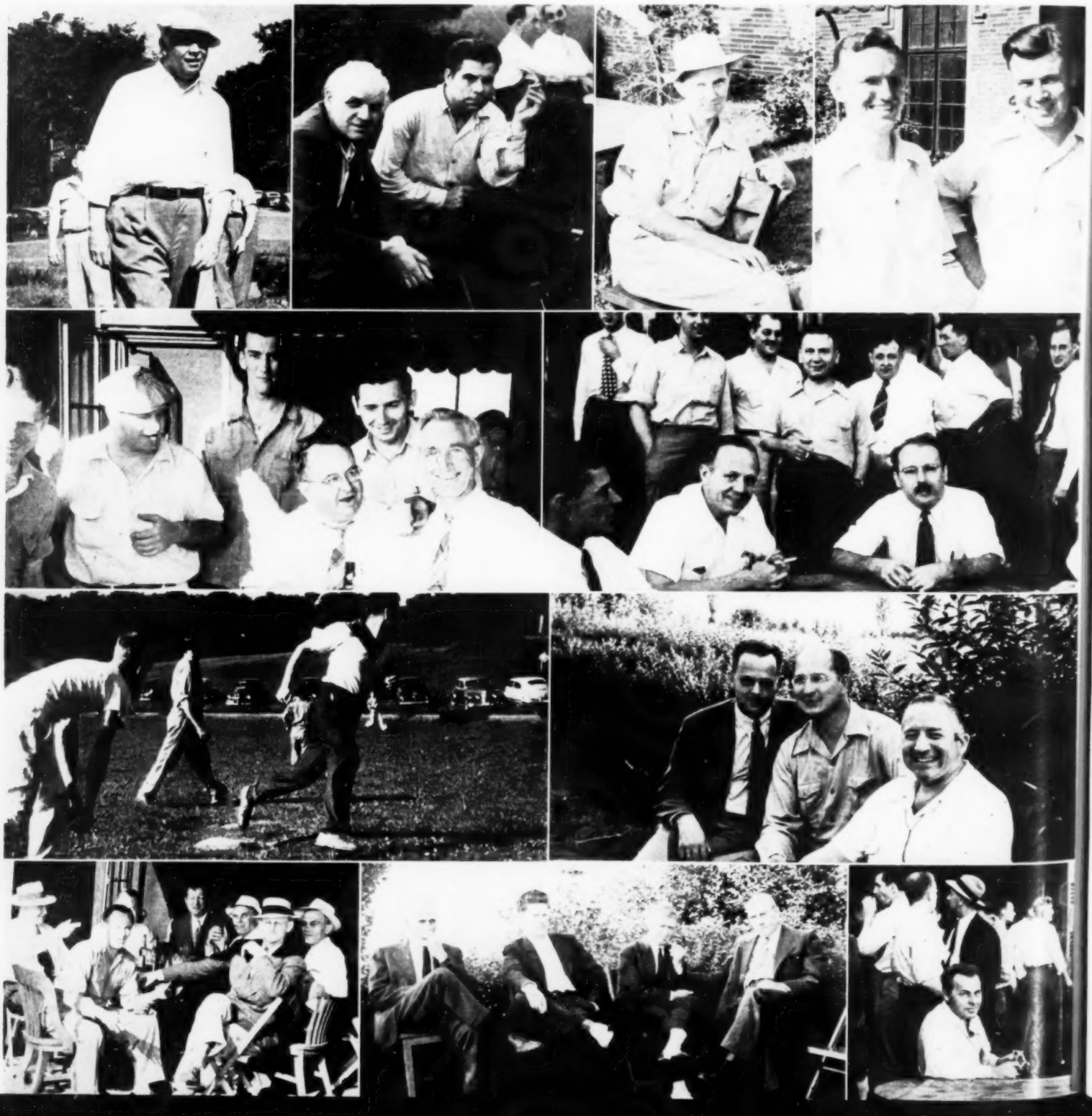


agencies. L. R. Rhinehart and C. L. Clark, production and inventory analysts of the Priorities Division of the War Production Board discussed the various forms and answered a long program of questions submitted in advance, written on blanks provided on the tables and presented orally and informally from the floor.

Mr. Rhinehart pleaded for patience, tolerance and co-operation on the part of foundrymen subjected for the time being to a heavy and at times bewildering burden. The sole object and desire of the government is to attempt the allocation and distribution of goods and materials, as equitably as possible to where they are most vitally needed, to stabilize prices, to prevent hoarding in the shape of huge and unnecessary inventories, and to push the war to a successful conclusion as soon as possible. Obviously the truly herculean task of correlating the myriad activities of a huge population depending for a livelihood on a more or less equitable exchange of goods, labor and money, and further complicated by the idiosyncrasies of human nature, could not be developed into a well oiled, noiseless and sweetly running machine over night.

The nation has been through other wars, but as every student of history knows, even if the lessons learned in one war are not forgotten, they are of little or no use in subsequent wars. No war in history can compare with the present world wide conflict in scope, extent, number of men involved, or in expense. The speaker admitted that the allocation and priorities program was set up on a cut-and-try basis. Constant effort is applied toward simplification. For example, a recent ruling showed that metal foundries are not required to file

Northeastern Ohio Chapter of the A.F.A. held one of its most successful outings in June at Lake Forest Country Club, Hudson, O., as these views will attest. Photos courtesy of Sterling Farmer, Sand Products Corp., Cleveland



form PD-25A for metals required for operating, repair and maintenance, unless the value exceeds $5000 per quarter. —*Pat Dwyer.*

Northern Iowa

ANNUAL business meeting and election of officers of the Northern Iowa Foundrymen's Association was held at Black's Tea Room, Waterloo, Iowa, Tuesday, April 28. The following were elected officers of the association for the year 1942-43: President, E. L. Fay, John Deere Tractor Co., Waterloo; Vice President, F. R. Synder, John Deere Tractor Co., Waterloo; Secretary, C. H. Harmon, Harmon Foundry Co., Waterloo; Treasurer, H. P. Hansen, Viking Pump Co., Cedar Falls, Iowa; Sergeant-at-arms, M. H. Lorenzen, Hawkeye Steel Products Co., Waterloo. The sound film, "Batting around the American League," was shown at the close of the business meeting.—*F. R. Snyder, vice president.*

Wisconsin

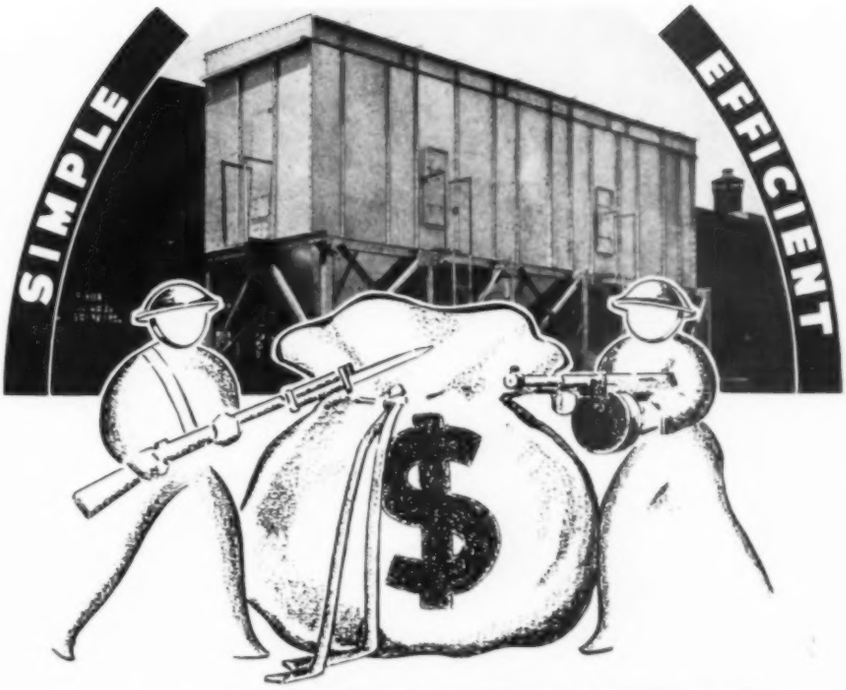
EVENTH annual golf furlough of the Wisconsin Chapter of the A.F.A. was held July 17, at the New Ozaukee Country Club, Milwaukee. More than 500 persons were present to make the outing an outstanding success in every respect, and was the largest attendance to date. The weather was ideal, perhaps the committee had contacted the weather man in advance, because it was one of the most beautiful days of the summer. Julius Heil, governor of Wisconsin, dropped in to relax a bit, and some of the officers of the national association also were present.

This year the prizes distributed were savings bonds and stamps which were greatly appreciated by the winners. Dick Jordan, the chapter's treasurer, made out his report which indicated that the golf committee headed by Don Stephens made the furlough a real success—*H. E. Ladwig, secretary.*

Northern California

ANNUAL meeting of the Northern California Chapter of A.F.A. was held at Hotel Claremont, San Francisco, June 12. A record attendance of 166 members, ladies and guests were present. Retiring Chairman, E. M. Welch, American Manganese Steel Co., Oakland, Calif., acted as master of ceremonies. In appreciation of his services during the past year, he was presented with a gift on behalf of the chapter. Past chairman, Ivan L. Johnson Jr., Pacific Steel Casting Co., Berkeley, Calif., made the presentation.

Report of the nominating committee was presented by S. D. Russell, Phoenix Iron Works, Oakland, and those nominated were elected unanimously. Chairman, F. A. Mainzer, Pacific Brass Foundry, San Francisco; Vice Chairman, H. A.



Let DUSTUBE
SIMPLICITY and EFFICIENCY
GUARD YOUR PURSE STRINGS

THE simplicity of design and high efficiency of Dustube Dust Collectors offer you the two most important advantages in dust control, and BOTH will save you money.

Simplicity of design means easy installation, low operating and maintenance costs, and "round-the-clock" operation with only a minimum of attention. You can get an idea of how simple this collector really is from the fact that it takes less than a minute to install or remove one of the dust tubes.

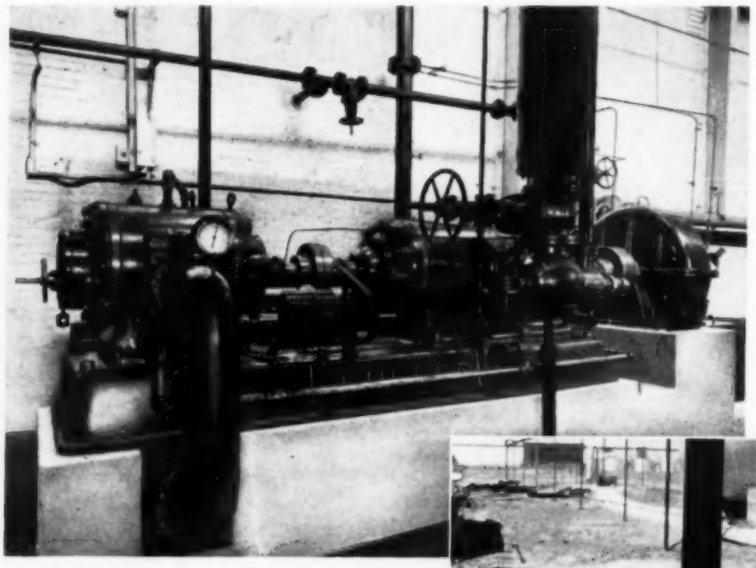
High Efficiency means that you get complete protection from hazardous dusts when the collector is coupled to an efficient hood and piping system—protection that meets the strict standards imposed by state health boards, labor departments, insurance companies, etc.

Be sure to investigate Dustubes before you buy. Add up the "plus" values they provide. Compare them point-by-point and you will understand why the Dustube customer list looks like a blue book of American industry.

AMERICAN FOUNDRY EQUIPMENT CO.
505 S. BYRKIT ST. MISHAWAKA, IND.

AMERICAN HIGH EFFICIENCY DUST COLLECTORS

Built in sizes to meet your requirements



Above: Two-stage Compressor installed in a copper refining plant. Capacity 1775 C.F.M., 100-lb. pressure.
Right: Single-stage Compressor installed in the oil fields of Texas. Capacity 125 C.F.M., 15-lb. pressure.

Single and Two-Stage Units . . . Capacities to 1800 C.F.M., 125-Lb. pressure

There's a Fuller Rotary Compressor that will meet your requirements. Built for direct motor or gas-engine drive without speed reduction, and for geared-turbine drive, they offer dependable service, keep maintenance at a minimum . . . in the long run, lower operating costs. Original capacities maintained for the life of the machine, plus many other inherent advantages, warrant your thorough investigation.

FULLER COMPANY
CATASAUQUA, PENNSYLVANIA

Chicago: 1144 Marquette Bldg.
San Francisco: 320-321 Chancery Bldg.

C-63

FULLER
PIONEERS OF HIGH-EFFICIENCY ROTARY COMPRESSORS

Bossi, H. C. Macauley Foundry Co., Berkeley, Calif.; Secretary-Treasurer, George L. Kennard. Directors elected to serve two years: Fred L. deSanno, DeSanno Foundry & Machine Co., Oakland, Calif.; J. F. Driscoll, Rincon Foundry Co., San Francisco; R. C. Noah, San Francisco Stove Works, San Francisco; E. M. Welch, American Manganese Steel Co., Oakland.

Following the election, the new officers and directors gave short talks of acceptance after which dancing became the sole activity.—*G. L. Kennard, secretary-treasurer.*

Book Review

Proceedings of The Institute of Australian Foundrymen; fabricoid, 150 pages 5½ x 8½ inches; published by the Institute of Australian Foundrymen, Melbourne Technical College, Melbourne, Australia, and available through the American Foundrymen's Association, 222 West Adams street, Chicago, for $6.

In addition to a list of officers and committee members, brief history of the foundation of the institute, the president's address, an account of the first annual meeting and a foreword, the book contains the principal papers and discussions presented at the various meetings held during the year 1939-1940. These papers include "Application of Electric Arc Type Furnaces to Metal Melting," by George P. Tinker; "Recent Developments in the Iron Foundry," by M. Eady; "Principles and Practices Involved in the Production of Steel Castings," by D. Clark; "Nonferrous Melting Practice," by R. A. Cheers; "Some Impressions of British Steel Foundry Practice," by N. Hosking; "Report of the International Foundry Congress in London, 1939," by W. Hanks; "Sand Testing," by H. A. Stevens; "Production and Uses of Pig Iron and Coke," by E. Davies; "Some Points on Cupola Practice," by William Pola.

Metals Inspection

Illinois Institute of Technology, Chicago, has completed an x-ray laboratory to train experts in radiographic inspection of metals. The designer, Dr. Otto Zmeskal, 28-year old metallurgist, joined the institute's war-training faculty 18 months ago. A class of 25 men will be in constant training in x-ray and radium testing in a special 10-week course. In addition, students in several other war-training courses at the institute will be given limited instruction. The training program is conducted both for private industry and for the government. Class and laboratory work includes training in inspection of three main groups of metals used in war production—brasses and bronzes; ferrous

metals of ordnance, armor and battleships; and aluminum and manganese aircraft.

* * *

Ohio Foundry Given Army-Navy Pennant

Ohio Injector Co., Wadsworth, O., has received the Army-Navy production award consisting of the new Army-Navy "E" for high achievement in the production of war equipment. Presentation ceremonies were held during August at the company's Wadsworth plant with Army and Navy officials making the award of the pennant to the company and of the Army-Navy "E" lapel insignia to all Ohio Injector Co. employes.

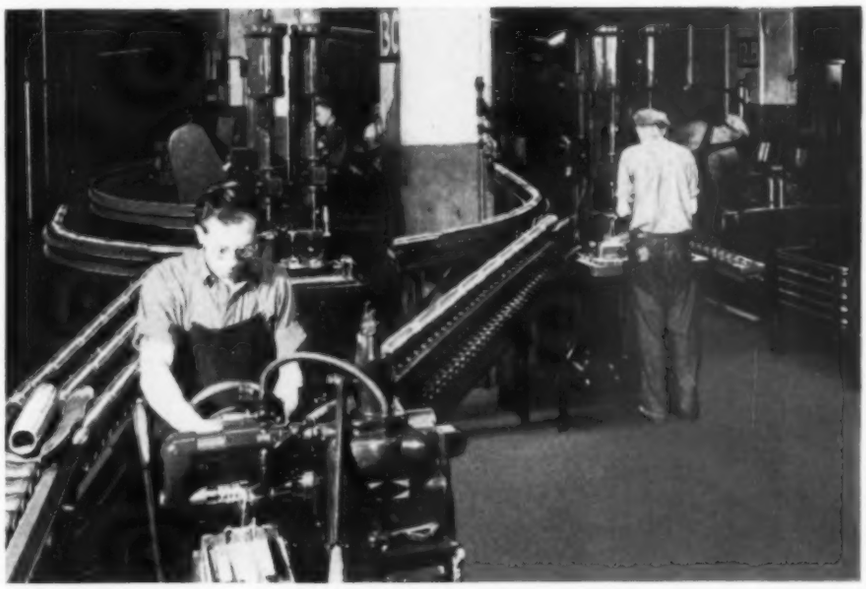
In the official communication announcing the award to the company, James Forrestal, under secretary of the Navy stated: "The high and practical patriotism of the men and women of the Ohio Injector Co. is inspiring and heartening. Their record will be difficult to surpass, yet the Army and Navy have every confidence that it was made only to be broken."

Advisory Group for Electrode Industry

An advisory committee for the carbon and graphite electrodes industry recently has been appointed by the WPB. Committee members include: H. S. Conrad, Stackpole Carbon Co., St. Marys, Pa., Ralph M. Hunter, Dow Chemical Co., Midland, Mich.; Andrew Kaul III, International Graphite & Electrode Corp., St. Marys, Pa.; Harry P. Martin, Acheson Graphite Corp., New York; and Henry L. Walker Jr., Great Lakes Carbon Corp., New York. M. H. Billings, Mica-Graphite branch WPB, is the government presiding officer.

Hays Corp., Michigan City, Ind., has appointed the following as representatives: Energy Control Co., Philadelphia; Engineering Products Co., Charleston, W. Va.; and Power Specialty Co., Houston, Tex.

MOVE MATERIAL
★ SWIFTLY—
SMOOTHLY—



With "Mechanized" Handling on Standard Conveyors

Maintain your "Victory" production pace . . . install Standard Conveyors to assure a smooth, uninterrupted flow of materials and parts through "mechanized handling" all along the production line—to avoid congestion in working areas—to release men for production work—to make better use of existing plant space.

Write for Bulletin F-9, "Conveyors by Standard"—shows all types of Standard power and gravity conveyors that will aid you to maintain and increase the schedule of production in your plant.

STANDARD CONVEYOR COMPANY
General Offices: North St. Paul, Minn.
Sales and Service in All Principal Cities

FIRST FOR FASTER PRODUCTION
"THE STANDARD OF VALUE"
Standard CONVEYORS

READER'S COMMENT

Readers are invited to comment upon articles and other editorial material appearing in THE FOUNDRY. *The editors cannot publish unsigned communications, but at their discretion may permit a writer to use a pseudonym when a bona fide reason exists for withholding his identity. Letters should be brief.*

THE EDITORS

To THE EDITORS:

Perhaps comment now is a little late on Mr. A. W. Gregg's timely article in the June issue of THE FOUNDRY on "Converting an Iron Foundry To Make Steel Castings."

Doubtless, on account of our special interest in the subject, we noted that only a very short paragraph was devoted to the question of pouring methods. The major emphasis, quite properly, was on the steel making process; but, the proper handling of the finished steel into the molds is so important, and the usual methods and equipment employed for pouring steel are so different from the iron foundry practice, that an iron foundryman making the conversion to steel will certainly have to seek some guidance on this subject.

A choice will have to be made from three possible types of ladles:—lip pour, teapot top pour or bottom pour. If he has been casting direct metal from the blast furnace, bottom pour ladles were probably used to prevent slag or "kish" from getting into the molds. With this exception, most iron foundries, of course, use the lip pour ladles.

If the basic open hearth or electric steel is used, it is compulsory to use bottom pour ladles which maintain the slag blanket over the steel at all times; otherwise, this type of steel will quickly freeze over the top. It is difficult to lip pour or hand-shank basic steel.

Those acid steel foundries, which have been using lip or teapot pouring, are trending toward use of the bottom pour ladle because it produces cleaner castings; that is it keeps the slag from getting into the molds.

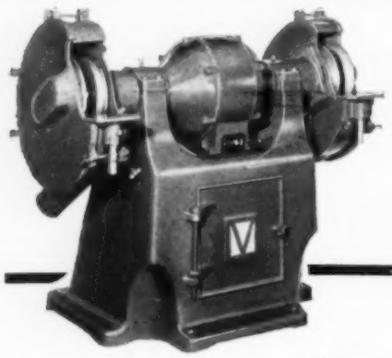
An exception is the use of lip pouring in foundries making manganese steel castings of various weights. This pouring method permits easier control of the casting temperature.

As competent advice in specific cases can readily be obtained from experienced steel foundrymen, as well as from the makers of the pouring equipment, no detailed instructions will be attempted here. However, if a foundryman has been using top pour ladle the bottom pour ladle with its stopper rod and nozzle may cause him some needless apprehension. While this equipment appears complicated, the materials and methods of assembly are all so well standardized that, with ordinary care in shop practice, bottom pouring can be used day in and day out with uniformly good results.

RICHARD H. STONE
Vesuvius Crucible Co.
Swissvale, Pa.

To THE EDITORS:

In the August issue on page 72 you advise the use of powdered ferrosilicon in the ladle to overcome difficulty from hard, brittle gray iron castings. Our practice is to drop a small lump approximately 1-cubic inch in size into the hand ladle. We find nearly 100 per cent recovery and less SiO_2 formed than with powdered ferrosilicon. Practice of adding lump ferrosilicon has been followed for the past 2 years after discussion with Don Reese and Richard Schneidewind, and excellent results have been obtained. Reese mentioned placing a 2-inch lump of ferrosilicon in the bottom of a 24-inch long bushing, 3 inches in diameter, and



WHY
Marschke Grinders
SATISFY
Astute Foundrymen

The 18" and 20" Universal Guard Marschke, 7½ hp. An extra heavy duty, medium size production grinder, very versatile. Gives maximum clearance on all sides of wheels; long or irregularly shaped pieces may be ground with ease. Wheel guard opening is adjustable to any point around the periphery.

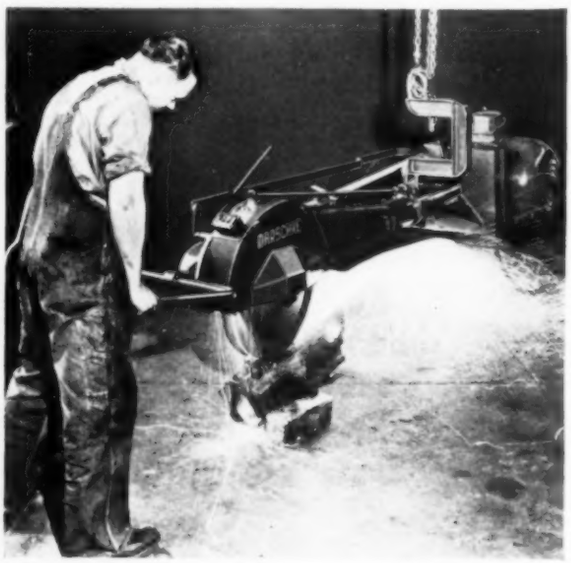
Maximum poundage of metal removal per abrasive wheel is the pay-off factor in selecting grinders and snaggers. By this yardstick no grinder surpasses a Marschke.

The smooth, true wheel rotation of every Marschke assures steady contact between wheel and work. Excellent bearing protection maintains that condition. Correct rate of wheel surface travel during all stages of wheel wear assures fastest production with genuine wheel economy. Extra conveniences contribute to speed of operation. As a result, Marschkes meet every foundry requirement—superbly. They quickly pay for themselves, and last a long time.

Investigate the 20" and 24" Swing Frame, also the 18" and 20" Single Speed and 24" Multi-Speed Floor Stand Marschkes.

Write for Catalog to Vonnegut Moulder Corp., 1839 Madison Ave., Indianapolis, Ind.

"Laboratory view" of a Marschke Swing Frame Grinder undergoing tests for study of spark action. Shields protect joints, belt and motor from the sand blast effect of sparks and grit to which vital parts of ordinary swing frames are subject. Notice how elimination of outboard bearings gives the operator a clear view of the work area.



MARSCHKE
QUALITY
GRINDERS
AND
BUFFERS

VONNEGUT MOULDER CORP. INDIANAPOLIS

tracing the diffusion of the silicon. As we recall the effect extended up about 14 inches to the peak of a cone. Addition of the alloy also adds heat to the ladle due to deoxidation reaction.

BOB LEICHT
Winona Machine & Foundry Co.
Winona, Minn.

TO THE EDITORS:

In the Question and Answer section of the July issue of THE FOUNDRY, a writer refers to trouble he is having with a lead-tin mixture. Where this metal is melted in crucible or furnace and then transferred to a pouring ladle, the trouble may be eliminated by equipping the pouring ladle with a spout extending to the bottom. That is the type of ladle usually referred to as a tea pot. Cover the metal with broken glass and allow it to rest quietly for a short time before pouring it into the molds. For the aluminum trouble, common salt stirred into the metal serves as a satisfactory flux.

CLARENCE WHITE
Mount Vernon, O.

TO THE EDITORS:

In the excellent article on the subject of "Light Alloy Castings in Aircraft" which appeared in the August issue of THE FOUNDRY, reference was made to the fact that the solution treatment of aluminum alloys is "usually done in electric furnaces."

While it may have been the practice in the past to use electric furnaces for this operation, today many tons of this material are being heat treated daily in gas-fired furnaces to meet the rigid physical standards demanded by present day users.

Properly designed, the modern, convection heated gas furnace can maintain any desired furnace atmosphere or meet the close temperature control required for work of this critical nature.

Many foundry owners are now faced with the problem of heat treating aluminum castings for the first time. Since they might get the impression from reading this article that electricity was the only accepted form of heat for this operation, I feel that in fairness to your readers who expect unbiased information, your advertisers who sell gas-fired equipment for this purpose, and to the gas industry, their attention should be called to the fact that gas, in either direct or indirect fired furnaces as the needs demand, is also an accepted fuel.

D. W. CHAPMAN
Manager, Industrial Sales
Peoples Gas Light & Coke Co.
Chicago

Doing a Big Dust Control Job in

CANADA

As in our own United States, workers in Canadian war plants need protection for themselves and their machines from the many DUST HAZARDS that always come with stepped-up industrial production.

Eager for the BEST, Canada too, comes to Pangborn for fool-proof, efficient Dust Control.

The picture above, taken at one of the largest munition plants in the Dominion, shows a typical small Pangborn installation doing a BIG JOB removing dust from a blast cleaning department in a steel foundry.

If you have any dust problem, large or small, do not delay longer. COME TO PANGBORN TODAY.

PANGBORN

WORLD'S LARGEST MANUFACTURER OF DUST COLLECTING AND BLAST CLEANING EQUIPMENT

PANGBORN CORPORATION · HAGERSTOWN, MD.

Reclaim Metal from Pot Skimming

By Charles Dreisbach

An important factor in considering metals reclamation in the nonferrous foundry is the ratio of labor and other costs to metal cost. With specific reference to recovery of metal from cinders, slag, skimmings, sweepings, etc., it may be pointed out that any modern type of reclamation plant will recover the metal at a cost within ¼-cent a pound including labor, power and water.

Estimating the amortization period for a milling and concentrating plant will include capital investment; amount in pounds of cinders, skimmings and sweepings to be milled per month; percentage of metal content; labor and power costs; water costs, and plant overhead.

Efficient and economical reclamation eliminates at once the old time practice of skimming all pots into a trough in the floor, and later mixing those with the sweepings and other metallic wastes into a common pile. Skimmings from the pots contain valuable alloys, and should be treated properly. Mixed materials can be sold to a secondary smelter, or treated in a cinder mill to recover the metallic content. The latter is dried, run over a magnetic separator to remove any ferrous particles, and then melted and run into ingots which are analyzed.

That procedure is absolutely necessary in these days when compositions of castings are held to rigid specifications. Also it is bad practice to remelt spills, skimmings, sweepings, etc. without washing in a cinder mill since such practice will carry dirt into the crucible, and cause excessive slag and dross which may wash into the mold cavity and result in hidden defects, revealed only after machining.

Previously it was mentioned that skimmings contain valuable alloys, and to obtain the highest salvage value, it is essential that those from each composition of metal be kept separate. Sweepings also may be handled similarly. One method would be to have steel barrels close to and easily accessible from the melting units. The barrels should be marked with symbols to indicate the particular alloy contained therein.

The barrels when full could be moved to the reclamation department for recovery of metallic content by treatment in a cinder mill. The reclaimed material, then could be remelted as part of the charge since its composition is known definitely.

DETROIT ELECTRIC FURNACES SAVE PRECIOUS TIME IN THE MELTING OF FERROUS OR NON-FERROUS METAL

A foundry producing bronze valves and similar pressure fittings in a 1,000-pound Detroit Rocking Electric Furnace over a 5 year period averaged seventeen heats every 9 hours.

Yet this is by no means an unusual case. Performance records from all parts of the country reveal that Detroit Furnaces are doing an exceptional job of speeding up foundry production. Whether you pour ferrous or non-ferrous metals or alloys, you can speed up your operations, save labor and floor space, reduce metal losses and maintain precise metallurgical control by using the Detroit Rocking Electric Furnace. Write today for complete facts.

DETROIT ELECTRIC FURNACE DIVISION
KUHLMAN ELECTRIC COMPANY • BAY CITY MICHIGAN

Awarded Navy "E"

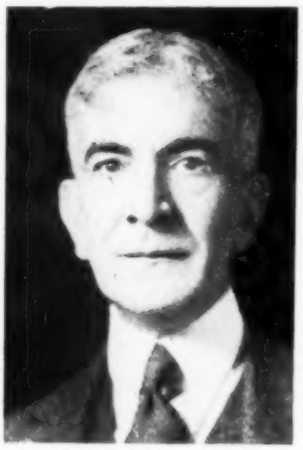
Harrison, N. J. plant of the Worthington Pump & Machinery Corp., recently was awarded the Navy "E" pennant for excellence of production. Rear Admiral Henry A. Wiley, U. S. Navy retired, made the presentation, and Hobart C. Ramsey, vice president in charge of operations, accepted on behalf of the Worthington organization. A crowd of more than 4000 Worthington employes, augmented by 3000 spectators, gathered outside the company's plant to participate in the ceremonies

Obituary

ROBERT E. BROOKE, 70, president, E. & G. Brooke Iron Co., Birdsboro, Pa., and chairman, Birdsboro Steel Foundry & Machine Co., died July 21. Mr. Brooke graduated from Yale where he attended Sheffield Scientific School. He began work as a blast furnace clerk at the E. & G. Brooke Iron Co., becoming treasurer in 1899 and president in 1933. He was elected vice president of the Birdsboro Steel Foundry & Machine Co. in 1898, president in 1912 and has been chairman of the board since 1934.

° ° °

James C. Alley, 77, dean of eastern pig iron salesmen, and active in business for 64 years, died July 26 in Brooklyn, N. Y. Mr. Alley was head of his own



James C. Alley

company, Eastern representative for Pickands, Mather & Co. He started his career as a boy of 14, first on the docks fracturing pig iron for grading as it arrived from England or Scotland and soon thereafter as a salesman. Mr. Alley's first connection was with the New York branch of Stevenson, Peirson & Co., Buffalo. He was a member of the American Iron and Steel Institute, American Institute of Mining and Metallurgical Engineers, Electro-Chemical Society, and also of the Army Ordnance Association.

° ° °

Lee Moses Rumsey, 66, retired president, Fort Worth Machine & Foundry Co., Ft. Worth, Tex., died Aug. 3, in New York.

° ° °

John H. Schmeller, 69, retired president and chairman of the board of directors, National Bronze & Aluminum Co., Cleveland, died Aug. 12. Mr. Schmeller was a partner in the Comstock Brass Co. which was reorganized in 1912 to form the National Bronze & Aluminum Co. He retired as president and chairman of the board in 1940 due to ill health.

° ° °

Eugene B. Clark, 69, president, Clark Equipment Co., Buchanan Mich., died in Chicago, July 29.

° ° °

Earl H. Fisher, 47, assistant to the president, Unitcast Corp., Toledo, O., died of heart failure on Sylvania Country Club golf course, Toledo, Aug. 9.

° ° °

Frank G. Crawford, foundry foreman, Union Spring & Mfg. Co., New Kensington, Pa., died Aug. 5. Mr. Crawford had served as foreman of the company for 22 years.

° ° °

Melvin G. Wilson, 59, a partner in the Wilson & Nutwell Foundry, Fresno, Calif., since it was organized 15 years ago, died July 19 in a Fresno hospital.

° ° °

Lieut. Col. Edward P. Reed, 44, chief of the inspection division, Chicago ordnance district, United States Army, died in Fort Sheridan hospital, Aug. 3, following an illness of 5 weeks. When Col. Reed joined the staff of the ordnance district in 1937, he was in the

Castings on the move

Whisk them through the Foundry;
Zip them through the Cleaning Room.

Use the following to shorten long jobs and eliminate unnecessary ones.

LION BINDER - A strong, fast drying paste; tie wires not needed. A strong binder that bakes very fast.

EASY CLEANER CORE COMPOUND - Makes cores that clean out of the castings readily.

VULCAN BLACKING - Can be adapted to swift application; gives good surface, cleans speedily.

DUST-ON FACING - Shake it on green sand molds, close and pour. No tooling. Fast cleaning.

SUPERIOR PLUMBAGO - Rubs in immediately; doesn't "lift" the sand - - peels beautifully.

SILKOTE - Paint or spray on steel foundry cores, dry sand molds and skin dried work. Adaptable to fast application. Casting surfaces are really clean.

Manufactured only by

J. S. McCORMICK CO.
PITTSBURGH, PA.
FOUNDRY FACINGS • SUPPLIES • EQUIPMENT

employ of the Rock Island arsenal, Davenport, Iowa. He was commissioned a major in the ordnance reserve June 18, 1941, and promoted to lieutenant colonel June 26.

° ° °

William M. Reay, 68, retired vice president, International Harvester Co., Chicago, died at his home in Winnetka, Ill., Aug. 7. Mr. Reay was born in Brampton, England. He came to the United States as a young man and entered the employ of the Harvester company upon its formation in 1902. He was comptroller for 20 years, and afterward served as vice president, the post he held upon retirement in 1935.

° ° °

W. A. Ratcliffe, former president, National Motor Castings Co., which is now a division of Campbell, Wyant & Cannon Foundry Co., South Haven, Mich., died July 23 in South Haven.

° ° °

John G. Benedict, 70, president, Landis Machine Co., Waynesboro, Pa., died in that city Aug. 4, after an illness of two years. Mr. Benedict joined the Landis Machine Co. in 1904 as secretary-treasurer. He also served as president, Canadian Landis Machine Co., Welland, Ont.

° ° °

William L. Rianhard, 81, treasurer, Whitehead Metal Products Co. Inc., New York, died July 24. Mr. Rianhard was one of the oldest active executives in the metal industry. He began his career as a clerk for Wallace & Sons, Ansonia, Conn., July 7, 1881. Later he became associated with Randolph Clowes, Waterbury, Conn. Those firms later became part of the American Brass Co. In 1898 Mr. Rianhard joined U. T. Hungerford Brass & Copper Co., serving until his retirement in 1916. He could not remain long in retirement. In 1917 he joined Whitehead Metal Products Co. as assistant treasurer and director. He became treasurer of the company, now a subsidiary of International Nickel Co., in 1924.

William L. Rianhard

REXALL & SAHARA

INNER-LOCKED BELTING

(Contains No Rubber)

★

The efficiency of our product with the foundry trade for handling sand and castings, hot and cold, is well established, being a standard with a great many foundries and engineers. Large stock of standard sizes.

★

IMPERIAL BELTING CO.

1750-1800 S. KILBOURN AVENUE

CHICAGO, ILL.

Book Review

Metals And Alloys; 156 pages 5¾ x 8¾ inches; paper; published by The Louis Cassier Co., Ltd., London.

This is the fourth edition of a compilation gradually increased in scope from the first edition which included the composition of 500 alloys, to the present edition which lists 3700 nonferrous alloys. It is primarily a list of alloys having definite names, either proprietary alloys of which the compositions have been recorded, or other alloys—Muntz Metal, Naval Brass, etc.— which, although not proprietary, or no longer so, usually have a fairly definite composition. For many of these alloys somewhat varying compositions have been recorded and these variations are cited. Many deletions have been made of compositions which do not differ in any marked extent from other compositions cited. A list at the end of the book shows the particulars of all known metals, symbol, color, atomic weight, specific gravity, electrical conductivity, heat conductivity, etc.

foundry activities

LINK-TRACK ENGINEERING CO., Chicago, has purchased from the Reconstruction Finance Corp. at auction the Durbin Steel & Malleable Castings Corp., Evansville, Ind. The purchase price was $60,000. Claude Rorabeck, president, Link-Track Engineering Co. states that approximately $150,000 will be spent for new equipment, including electric furnaces to convert the plant into a steel foundry. The Durbin property consists of a steel structure covering about 50,000 square feet which is fully equipped as a malleable foundry. The Link-Track company, established in 1933, manufactures track links for tractors and tanks.

° ° °

Osgood Co. which operates the Commercial Steel Casting Co., Marion, O., is building a plant addition.

° ° °

Detroit Brass Foundry, 5128 Alhambra avenue, Los Angeles, is building an addition to its plant.

° ° °

Sinking Spring Foundry Co., Sinking Spring, Pa., has discontinued operations indefinitely.

° ° °

George Adler Brass & Aluminum Castings, 1510 University road, Cleveland, is preparing to enlarge its foundry.

° ° °

Erie Foundry Co., Erie, Pa., has let contract to Henry Shenk Co. for a plant addition. D. A. Currie is president.

° ° °

Newport News Foundry Co., Newport News, Va., recently was damaged by fire.

° ° °

Tennant Steel Casting Co., 3444 Thirteenth avenue Southwest, Seattle, is increasing capacity and building a plant addition.

° ° °

W. A. Tober, manager, Watervliet Foundry Co., Watervliet, Mich., has purchased the Ashton Equipment factory building and property. The company plans addition of a cleaning and shipping room and installation of a heat treating plant.

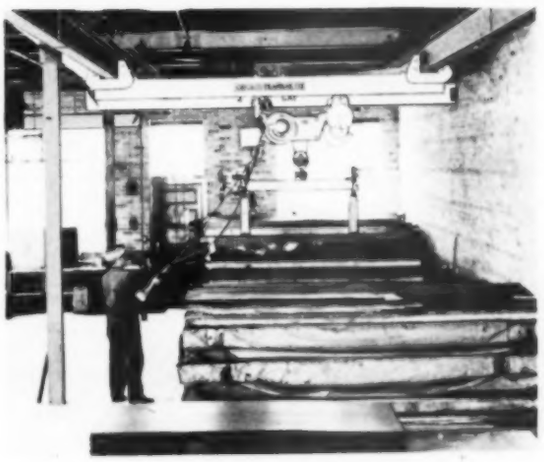
° ° °

New Process Bronze & Aluminum Foundry Co., Cleveland, has moved all equipment and activities to a plant at 1276 East Fifty-fifth street, Cleveland, formerly occupied by U. S. Foundry Inc.

° ° °

Climax Engineering Co., Clinton, Iowa, has become a subsidiary of General Finance Corp. The move was made to finance war projects in which the company is engaged for the Army and Navy

Speed War Production with
CRANES
FASTER SAFER HANDLING AT LESS COST!



Keep Ahead of Delivery Dates by Installing this
MONORAIL
Underhung
Single Beam
Side-Braced
CRANE
(Up to 45 ft. Span)

Furnished in Push Type—Hand Geared—Motor Driven Type—One, Two and Three Motor, Floor Controlled, Up to 5 Ton Capacity

★ You are going to see a worthwhile pick-up in materials handling speed, and effect big labor savings when you install the standard Monorail Crane illustrated above.

Use either the Push-Type Hand-Geared or Motor-Driven type equipped with 1, 2 or 3 motors operated by pushbutton control from the floor. Span up to 45 ft. between beam centers. Motor driven types have reducer units fully enclosed, running in oil. Trucks on all types are structural members of box construction for strength and rigidity. Steel wheels have double row ball bearings.

PILLAR TYPE No. 1046A

A self-supporting crane with 220 degree swing. Capacity up to 3000 lbs. with 14' radius. Furnished with hand or electric hoist, as required.

WRITE TODAY—State fully your Monorail Crane requirements. Get new circular on complete Jib Crane line now. No obligation.

CHICAGO TRAMRAIL COMPANY
2910 CARROLL AVE. Phone KEDzie 7475 CHICAGO, ILL.

and at the same time to conduct its indirect defense business through its regular channels of distribution.

° ° °

Pelton Steel Casting Co., 148 West Dewey place, Milwaukee, has let contract for a pattern storage vault and a flask and pattern layout building.

° ° °

Index of new equipment orders for June, 1942, according to a report of the Foundry Equipment Manufacturers' Association, Cleveland, was 884.4 as compared with 730.2 in May. Index for repairs was 441.5. The index of 100 represents the monthly average of reported sales to metalworking industries during 1937-38-39.

° ° °

Western Brass Works, 1460 Naud avenue, Los Angeles, is building several additions to its plant. Walter V. Storm is president.

° ° °

Nordberg Mfg. Co., Milwaukee, has purchased a factory building at Sturtevant, Wis. for re-erection at 3037 South Chase avenue as a machine shop. The company also obtained permits for an additional factory building to cost $30,000 and a $10,000 office structure.

° ° °

Falk Corp., 3001 West Canal street, Milwaukee, has let contract for design and construction of a foundry to Klug & Smith, 111 East Wisconsin avenue.

° ° °

Bohn Aluminum & Brass Corp. has awarded contract to John A. Lammert for alterations to its plant at 2599 Twenty-second street, Detroit.

° ° °

Titusville Iron Works Division, Struthers-Wells-Titusville Corp., Titusville, Pa., has let contract for a one-story plant addition.

° ° °

Chicago Pneumatic Tool Co., Franklin, Pa., has let contract to Osborn Construction Co., Franklin, for a foundry addition.

° ° °

Sherwood Brass Co., 6331 East Jefferson avenue, Detroit, has awarded contract to Bennage & McKinstrie for alterations to its foundry.

° ° °

Dominion Foundries & Steel Ltd., Depew street, Hamilton, Ont., is having plans prepared for an addition to its foundry. C. D. Howe Co. Ltd., Pigott building, is designing engineer.

° ° °

Massey-Harris Co. Ltd., Market and Greenwich streets, Brantford, Ont., has let contract to Cromar Construction Co. Ltd., Brantford, for a plant addition. Additional equipment will be installed.

° ° °

A new addition to American Steel Foundries at Indiana Harbor, Ind., is to begin operations soon. The plant is situated on an 82-acre site and will manufacture cast steel armor plate.

° ° °

Quality Castings Co., Orville, O., is building an addition to its foundry to increase its output of magnesium castings. New equipment to be installed includes furnaces, oil treatment devices and blast equipment. H. C. Nichols is proprietor.

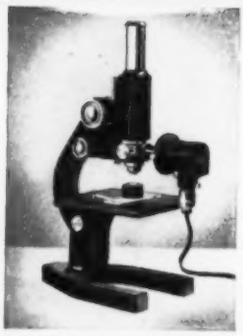
° ° °

Utility Trailer Mfg. Co. has obtained a certificate to operate a foundry under the name of Utility Electric Steel Foundry at 3334 Slauson avenue, Los Angeles. G. L. Knox is vice president and H. C. Bennet, secretary.

° ° °

Link-Belt Ltd., 791 Eastern avenue, Toronto, has let general contract to Oscar Wiles, Kitchener, Ont., for two oil-fired brick core ovens, alterations to plant and installation of an overhead crane at its plant in Elmira, Ont.

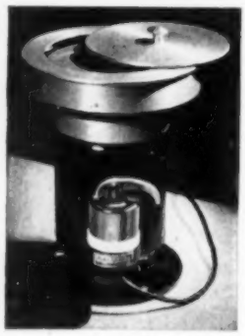
"for technical control"



M A MICROSCOPE

This foundry microscope is an economical answer to your inspection problem.

2300 M A METAL MICROSCOPE 50X-500X in cabinet with vertical illuminating unit with rheostat 110 v. DC or AC., objective 16 mm and 4 mm, eyepieces 6.4x and 12½x.



SPECIMEN POLISHER

Indispensable for the delicate final polish of test specimens.

1500 A B STANDARD POLISHER with 8" interchangeable polishing disc mounted to ¼ hp ball bearing motor 110 v. 60 cy. single phase A.C., 575-1150 rpm with directions.

DUST COUNTER

Provides an accurate and periodic check of the efficiency of dust removing equipment.

3220 B&L DUST COUNTER complete with sampling apparatus, microscope, substage lamp, slides, cover glasses, bottle, camel's hair brush, and data book.

SEND FOR COMPLETE CATALOG
DEPT. F. 228 NO. LA SALLE ST. CHICAGO, ILLINOIS

HEADQUARTERS *for*

- Belt Surfacers
- Cameras, Macro and Micro
- Carbon Meters
- Chairs, Laboratory
- Colorimeters
- Cut-Off Machines (Specimen)
- Dilatometers
- Dust Counters
- Grinders, Belt and Hand
- Hardness Testers, Portable
- Illuminators
- Magnifiers
- Metalloscopes
- Metallographic Equipment
- Microscopes, Metal
- Mount Presses (Specimen)
- PH Meters
- Photometers
- Polishers, (Specimen)
- Protractors, Optical
- Pyrometers
- Rectifiers, Mercury Arc for Photo Micrography
- Refractometers
- Spectrographs
- Stereoscopes
- Stools, Laboratory
- Titrators

Adolph I. Buehler
OPTICAL INSTRUMENTS • METALLURGICAL APPARATUS
228 NORTH LA SALLE ST. • • CHICAGO ILL.

CONVERTER STEEL WILL MEET REQUIREMENTS

(*Continued from page* 89)

shop as heats 715 and 724.

All coupons were received in the green or as-cast condition and all heats were given the same heat treatment. This consisted of heating the coupons to 1650 degrees Fahr., holding for 2 hours, and cooling separately in still air. One set of tension bars was machined and tested within three days of the normalizing treatment. All the rest of the coupons were annealed at 750 degrees Fahr. for 15 hours. This annealing temperature was chosen because it is known to eradicate hydrogen embrittlement without affecting the tensile strength of a normalized medium-carbon steel. Aging at normal temperatures for a longer period will accomplish the same result. Any improvement in ductility produced by this low-temperature anneal is regarded, therefore, as a qualitative evidence of hydrogen embrittlement in the normalized bars.

Steels Were Analyzed

In most instances, plant analyses were furnished with the steel specimens, but all steels were analyzed at Battelle Institute and, in addition to the common elements, copper, chromium, nickel, molybdenum, and nitrogen were determined. In those few cases where the plant analyses and Battelle Institute determinations did not agree, an umpire analysis was made by a third laboratory.

The compositions are shown in Table I. It will be noted that although the carbon varies from 0.21 to 0.35 per cent, the manganese from 0.50 to 0.88 per cent, and the silicon from 0.28 to 0.55 per cent, they all come in the grade B classification. Some question might be raised in regard to the chromium and nickel content of the basic electric furnace steel E-1 and the copper content of the triplex steels because these residuals undoubtedly affect the properties as will be pointed out later.

As might be expected, the basic open-hearth steels are lower in phosphorus than any of the others, while the converter steels as a class are slightly higher in phosphorus than the acid open-hearth and electric steels. The triplex steels were given a ladle dephosphorization treatment which was effective except in heat H-42 where converter slag got into the ladle and made the dephosphorizing slag too acid.

The basic open hearth also has a slight advantage in sulphur content, but the desulphurizing treatment of the cupola metal has put the converter steels on a par with the acid electric and acid open hearth in respect to this impurity.

Nitrogen contents were determined by the Cunningham distillation method which is standard for wet methods, but the accuracy of the reported results is not considered greater than ±0.002 per cent. Certain trends, nevertheless, are apparent. The triplex steels have the highest content with an average of about 0.011 per cent; the straight converter steels and acid electric steels are in the same range of 0.006 to 0.010 per cent, while the open-hearth steels have a still lower range of 0.004 to 0.006 per cent.

Microscopic examinations were made to determine the nature of the inclusions and the grain size, inasmuch as both are known to affect the mechanical properties. Except that the high sulphur steels had more sulphides than those low in sulphur, there was no notable difference in cleanliness.

The type of inclusion was found to coincide closely with the deoxidation practice and particularly with the use of aluminum, as described by Sims and Dahle[1]. When no aluminum was used,

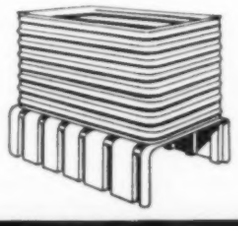
DURABILITY

—inbuilt feature of every Truscon Foundry Flask!

They're made to take a lot of slamming and banging around . . . they stay strong and rigid under steady pouring schedules, year after year . . . because Truscon designs and builds flasks to meet *exactly* the *particular* requirements of light, medium and heavy casting work.

Correct thickness of flask walls . . . proper placing of flanges . . . types of handles and pin lugs . . . these features assure quick, economical, long-life production in your plant.

Write for illustrated catalog giving Truscon Foundry Flask details that may help you increase foundry profits.



TRUSCON STEEL BOXES AND SKID PLATFORMS permit the *efficient* storage of materials, and *efficient* movement to production lines. Extremely durable and long-lived. May we study *your* material-handling problem? Truscon Steel Company, Pressed Steel Division, 6100 Truscon Avenue, Cleveland, Ohio. Subsidiary of Republic Steel Corporation.

TRUSCON FOUNDRY FLASKS

regardless of whether calcium or titanium were used, the inclusions consisted of globular sulphides and silicates. These are designated type I and steels with this type are inclined to have good ductility.

When additions of aluminum too small to leave an appreciable excess are used, the silicates disappear and the sulphides assume the form of an eutectic. Such chain or film type sulphides, strung along the primary grain boundaries, act as zones of weakness and produce poor ductility. This was described by Sims and Lillieqvist[2]. These inclusions in the steel are designated as type II.

If aluminum is used in sufficient amount to leave an appreciable excess, the sulphides are larger, farther apart, and are irregular in shape or are crystalline. Many duplex inclusions appear. These are type III inclusions. Steels with these inclusions have good ductility but not quite so good as with the type I inclusions.

The grain size listed in the tables is the grain size of the steels as normalized from 1650 degrees Fahr., the condition in which they were tested. Although the grain size does not vary over a wide range, it does show the aluminum deoxidized steels to have the smallest grain size, with the titanium deoxidized steels showing an advantage over those with no special deoxidizer.

The data in Table II, covering tension, hardness, and notched bar-impact tests, give a general comparison of the properties most commonly determined for these steels. The yield and tensile strengths shown are slightly higher than those ordinarily obtained commercially for similar compositions because the individually handled laboratory bars cooled somewhat faster.

The yield and tensile strengths, however, follow the compositions very closely. High carbon or manganese content, or a combination of high carbon and high manganese, produce hi h strength. The chromium and nickel content of heat E-1 has increased the strength of this steel, whereas the copper in the triplex steels has a negligible effect.

The draw or low-temperature anneal caused a slight average drop in the yield strength but had no effect on the tensile strength.

Other things being equal, the ductility tends to vary with the composition. Carbon and sulphur are the most potent elements and the ductility decreases as either or both of these elements increase. Superimposed on these effects, however, is the strong effect of inclusion type and it will be observed that all of the steels with type I inclusions have very good ductility.

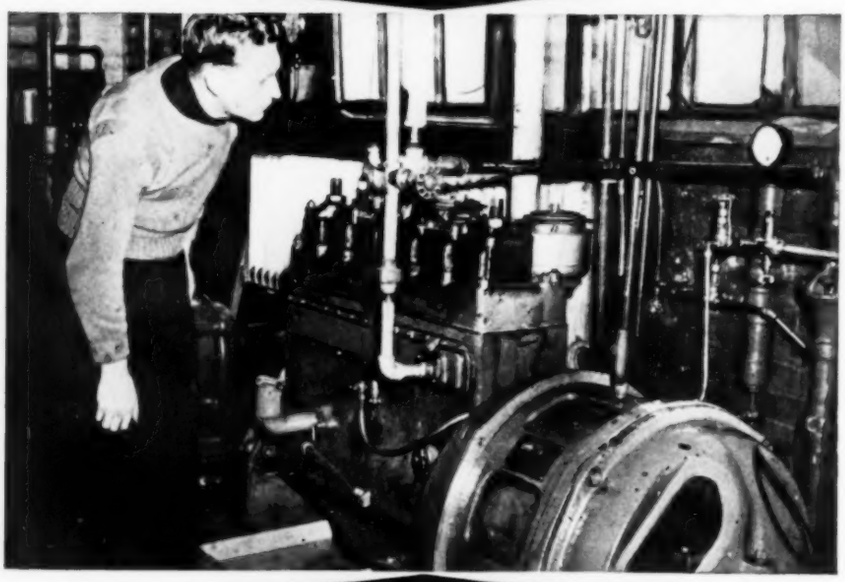
The three steels with type II inclusions, E-1, B, and C, all have poor ductility, although this can be accounted for in part by the high carbon contents. With the exception of the triplex steels, all of the steels with type III inclusions have good ductility but average a little lower than those with type I. The ductility of the triplex steels is somewhat lower than can be accounted for by composition, but some of the inclusions in these heats are close to type II.

Hydrogen embrittlement, as indicated by the improvement of ductility produced by the draw, is present in the basic open-hearth heat 9551, acid electric heat 1163, basic electric heat E-1, and the converter steels 1, 2, 3, 4, A, and B. This indicates a greater prevalence in the converter steels, although some trouble with hydrogen is not uncommon in the other steels. There is some indication that present practices tend to minimize this trouble.

Brinell hardness numbers were taken on sections cut from the center of the coupons and, as usual, follow the tensile strengths very closely.

Notched-bar impact tests were made both on V-notch Izod specimens and keyhole-notch Charpy specimens. The Izod values, although higher, follow the

420 cu. ft. of air from 23.4 sq. ft. floor area ....with integral cooling



...offered by Schramm in a complete "BUILT-IN" MOTOR DRIVE COMPRESSOR UNIT

More air in a hurry—that's what Schramm Compressors supply in small space, when and where needed and without special time-consuming foundations, assembly or piping.

Note the compactness of the Schramm unit shown here in comparison with a man of average size. Both motor and compressor are mounted as a single unit on a sub-base that serves as a foundation. Such a unit can be installed wherever current is available. Floor space for the 420 cu. ft. model shown is only 90" x 37½".

Integral water-cooling is another feature. If you were to "Watch the Thermometer" on any Schramm water-cooled compressor you would find no wide variation between the temperatures on the different sides of the cylinder heads, an advantage that eliminates unequal expansion and contraction.

SEND FOR CATALOG 42-S

SCHRAMM, INC. *The Compressor People* WEST CHESTER, PA.

SCHRAMM *Air Compressors*

same trends as the Charpy figures and both, in general, bear a close correlation to the ductility. Comparing steels with the same ductility, however, it is apparent that the aluminum deoxidized steels have the highest average impact ratings, whereas those treated with titanium show no advantage over those without a special deoxidizer.

It so happens that most of the aluminum deoxidized steels are converter steels, but because this effect of aluminum is well known, no significance is given to the method of production.

All of the properties in Table II, therefore, seem quite orthodox for grade B steel and can be accounted for by composition and deoxidation practice.

One of the properties in which converter steel has been alleged to be especially vulnerable is notch sensitivity at low temperatures. However, data are on the record[2] for properly aluminum-killed bessemer pipe (0.15 per cent carbon) that gave Charpy values of 50 foot-pounds at room temperature, 34 at —25 degrees Fahr., and 21 at —50 degrees Fahr.

Large tonnages of such pipe have been in successful commercial use over a period of years. While this behavior of wrought steel leads to the expectation of similar behavior of cast steel, direct evidence was lacking.

Considerable attention was given, therefore, to low-temperature notched-bar impact tests in the present study. It is well known that such tests differentiate sharply between steels properly and improperly deoxidized, whereas the static tensile properties at low temperatures do not. All the impact tests at low temperatures were made with standard keyhole-notch Charpy bars, single and double width.

The specimens were cooled by immersion in a bath of acetone and dry ice and were broken within 3 seconds after removal from the bath. During this interval, they would warm up from 2 to 4 degrees Fahr. and, to compensate, the bath was held to a temperature 3 degrees Fahr. below the desired breaking temperature. Each bar was held 15 minutes at temperature while the bath was agitated, before testing.

In all cases, the tests were made in duplicate but further check tests were made when it seemed to be desirable. Check tests were made primarily where the original duplicate tests gave erratic results. Data are shown graphically in Fig. 1 on page 88.

It may be observed from the illustration that the impact values gradually decrease with drop in temperature until suddenly they become very erratic or drop to a much lower figure. It is this drop-off, where the steels change from a relatively tough to a brittle material, that is most important to determine.

It is obvious, of course, where duplicate tests give such values as 17 and 2 foot-pounds, that chance might just as well have given either two high values or two low values. Too much importance, therefore, must not be placed on individual figures; trends are of greater moment.

Among the acid open-hearth heats, the heat 493 begins to show erratic values at —20 degrees Fahr., 509 and F-1 at 0 degrees Fahr., and F-2 at —20 degrees Fahr. At —40 degrees Fahr. three show extremely low values.

The basic open-hearth heats held up better and 9551 and 9567 show no drop-off until —40 degrees Fahr., while Q-1 and Q-2 drop off sharply at —20 degrees Fahr. The better properties of these steels may be attributed tentatively to the relatively low phosphorus content. These steels had no special deoxidation.

Erratic results were obtained at 0 degrees Fahr. for acid electric steels, heats 715 and 1009, at —20 degrees Fahr. for 724, while 1025 failed at —40 degrees Fahr. The fifth heat of this series (1163), however, exhibits no erratic behavior but only a gradual reduction in

A VITAL FACTOR IN AIR DEFENSE

Processing of Magnesium Can Now Be Done Safely

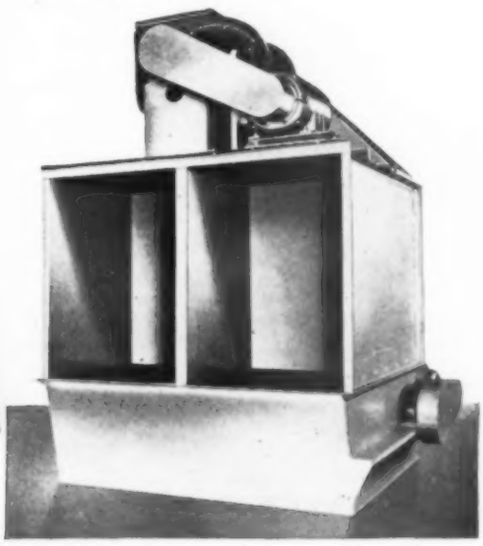
The New Hydro-Whirl Makes This Possible

At last the hazards attending the processing of magnesium have been removed. The development of the Hydro-Whirl principle of dust control opens the way to increased use of magnesium—a metal generally avoided because of its dangerous characteristics.

The Hydro-Whirl is a wet dust collector adaptable to many purposes —for either flexible shaft or stand grinding. Every industry—particularly the airplane industry—welcomes this new equipment because it meets a vital need at this time. It increases the measure of safety and broadens the possibilities of greater production.

The showing of such high efficiency on magnesium proves that it can perform with equal success with other dusts such as aluminum, iron, steel, etc.

Discuss your dust problems with our engineers



Industrial
SHEET METAL WORKS
Manufacturers of Hydro-Whirl Dust Collectors and Spray Booths, Ovens, Mechanical Washers and Industrial Ventilation Systems.

625 E. Forest Avenue **Detroit, Michigan**
New York Office—370 Lexington Avenue

impact value down to −80 degrees Fahr., where a sharp drop was obtained. It should be noted here that the first four steels were treated with titanium and calcium, whereas the last was deoxidized with 2 pounds of aluminum per ton.

The basic electric heat, starting rather low, shows no inconsistency and falls gradually to a low value at −60 degrees Fahr. The nickel content of 0.43 per cent is thought to be of benefit in this steel because the aluminum content is too low for the best effect.

The triplex steels held up very well down to −60 degrees Fahr. Only heat H-42, which has a low value at room temperature, shows erratic behavior at −40 degrees Fahr., but none of them shows a reduction to less than half the room temperature value until −60 degrees Fahr. is reached. The copper content of these steels undoubtedly aids the low-temperature properties but they also were deoxidized with 2 pounds of aluminum per ton.

The converter steels, heats 1 to 4, inclusive, have easily the best low-temperature properties. Only heat 4 begins to show erratic results at −80 degrees Fahr. All of these steels had an addition of 2 pounds of aluminum per ton. Heats A, B, and C to which 1 pound of aluminum per ton was added begin to fail in the range of −20 degrees Fahr. to −40 degrees Fahr., whereas heat D to which about 1.5 pounds of aluminum was added is consistent down to at least −60 degrees Fahr. Generally speaking, all specimens which gave impact values less than about 5 foot-pounds had brittle fractures, while those above this figure showed some toughness.

Data on the low temperature impact values are shown graphically in Fig. 1. There is some scatter in the data, but it is believed that straight lines represent the true trend. For those steels showing a sudden change from tough to brittle fracture two separate curves are drawn, because in most instances, there are no intermediate data. Where the upper and lower curves overlap, however, there is apt to be some erratic results.

Superficially, these low-temperature notched-bar impact values seem to show a distinct advantage for converter (including triplex) steel, but the evidence of acid electric heat 1163 and the converter steels B and C clearly indicate that the melting medium is of secondary importance at best and that the deoxidation practice is paramount. The value of deoxidation and aluminum additions in enhancing the low-temperature toughness of steels has been shown by Herty[4], and by Kinzel, Crafts and Egan[5].

An exception to the above statement should be made in the case of the basic open-hearth furnace, if it can be shown that low phosphorus content, which is more or less inherent to the process, is responsible for the good properties shown by these steels.

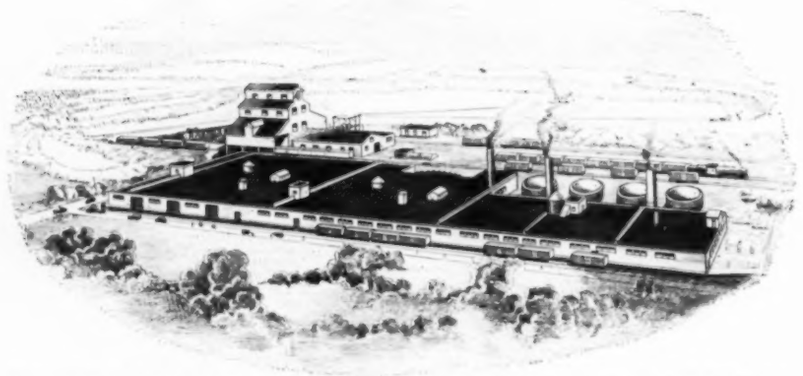
As a further check on the low-temperature notch brittleness of these steels, a limited number of double width Charpy bars were broken at temperatures in the region of the drop-off shown by the single width bars. As shown by Hoyt[6] and by McAdam and Clyne[7], a double width Charpy bar of a tough steel will require approximately double or at least a substantially greater amount of energy to break as for a single width specimen of the same steel. A brittle or notch-sensitive steel, on the other hand, will break with considerably less energy absorption for a double-width specimen.

It might be expected that the results obtained would show a different trend or be more erratic, yet they present substantially the same picture. In general, the first signs of brittleness are observed at a slightly higher temperature with the double-width specimens, but in a few cases, this is reversed.

The ability of a material to retain its impact strength after strain age-harden-

GOOSE LAKE

Fire Clay and
Fire Clay Flour
Fire Clay Brick
Therm-O-Flake Insulation



Goose Lake Clay Deposit with Clay Grinding and Fire Brick Plant

Illinois Clay Products Company

JOLIET, ILL.

ing is often considered of importance in evaluating it for some applications. Converter steels have been considered to be especially susceptible to strain age-hardening effects because of a supposedly high nitrogen or oxygen content. In view of this, a number of comparative tests were made on the cast steels.

Specimens of the normalized and drawn coupons were machined to oversize dimensions for the standard impact bar. These then were compressed in the center of the specimen for about ¼-inch on either side of the notch location until they were cold worked 10 per cent. The specimens, after the cold working treatment, next were finish machined to size and the keyhole notch put in the center of the worked portion. Four specimens were machined from each steel, two of which were tested as cold worked. The duplicate pair of specimens were aged at 475 degrees Fahr. for 30 minutes and then tested at room temperature. Rockwell "B" hardness data were also obtained and it was noted that the major increase in hardness of the steels occurs after cold working. The aged specimens show only minor differences in comparison with the cold-worked specimens as a result of the aging treatment.

Reduce Impact Resistance

Impact strength values, on the other hand, show marked reduction, the major portion of which occurs in some of the steels after cold working and in others after aging. This is illustrated best by the percentage of reduction figures. In comparing these data with the deoxidation practice used, some relationship is evident.

Those steels having no strong deoxidation treatment, as a rule, are much more susceptible to aging after cold working than are the steels fully deoxidized. It was observed in the data that the former steels show substantially larger decreases in impact strength after aging than do the latter steels. The steels receiving the strong deoxidation have the major reduction in impact strength occurring after cold working. The two basic open-hearth steels, 9551 and 9567, are apparent exceptions to this rule and show good resistance to strain aging.

The effect of deoxidation practices on the aging tendencies of these steels has a corollary in its effect on aging in deep-drawing steels. In the rimming steel grade of deep-drawing steels, no aluminum is used and the steel is strongly susceptible to aging after the temper rolling following the annealing operation. When this grade of steel has been killed with aluminum, however, it loses its aging characteristics to a large extent and is known as a nonaging killed steel.

The fatigue or endurance strengths of the grade B steels has assumed an importance greater than normal during the present emergency. Very few data are available on cast steels which could be used in comparing the various steels produced by the different melting units. Therefore, a few tests were made on representative steels from each group received.

In order to obtain a fairly complete analysis of the fatigue properties of the steels, two types of specimens were run in the tests. These were standard smooth specimens and Kommers square-notched specimens. Two of the steels, the acid electric steel 724 and converter steel 3, were also tested at −40 degrees Fahr., using the notched specimens only. Similar low-temperature tests were run previously at Battelle and the operation of the equipment is described in detail in a paper by Russell[5].

Data for the standard specimens show a distinctly higher endurance ratio for the two acid steels than for the basic and converter steels. Inasmuch as only one heat from each group was run, however, no generalization can be made.

The notch endurance tests at room

GATES and RISERS in any metal

in far Less Time with

Tannewitz METAL CUTTING BAND SAWS

Variable Speed

Models to fit Every Need

In addition to our regular High Speed Band Saws delivering over 2 miles of smooth vibrationless saw travel per minute, which have proved so exceedingly popular in automotive and aviation work, the TANNEWITZ line now offers five other models to provide the fastest cutting medium for every foundry need: a 30" machine to provide any speed from 300 to 900 blade feet per minute—a similar machine with 3-step V-belt drive to give 2300, 3100, 4000 blade feet per minute—a 36" machine with 32" capacity under the guide—a model with 48" wheels and one with 52" wheels, operating at 3,000 blade feet per minute for handling extra large castings. Get a line on the TANNEWITZ metal cutting band saw that fits your particular needs. It will save time, step up production and repay its cost dozens of times. Write for full particulars NOW!

THE TANNEWITZ WORKS, GRAND RAPIDS, MICHIGAN

temperature, on the other hand, have a striking uniformity which shows no preference for any group. Likewise, the two steels tested as notched bars at −40 degrees Fahr. give very similar results. Since steel 724 had only 2 foot-pounds. Charpy impact resistance at −40 degrees Fahr., it is evident, as might have been expected, that fatigue properties do not reflect the types of brittleness brought out by single-blow notched-bar impact tests but, instead, fall in line with the static tensile properties.

All of the endurance limits are within normal expectations and do not appear to be influenced by deoxidation practices in the same manner as some other properties tested.

Commercial cast steels made by six processes of melting were compared as to composition and mechanical properties. The compositions of all were normal.

The basic open-hearth steels had lower phosphorus contents. If the identification were to be removed from the others, it would be difficult to decide by what process they had been made.

The converter steels, as a group, were deoxidized with aluminum, whereas only two of the other steels were aluminum killed.

The microstructures were governed by the deoxidation practice, both as to inclusion type and grain size. Aluminum was the only deoxidizer that caused a definite change in type of inclusion. Titanium produced some grain refinement but not so much as aluminum.

The room temperature mechanical properties were entirely orthodox for grade B cast steel, and varied with the composition and type of inclusions, without regard to the method of manufacture.

The converter steels, as a group, had the best low-temperature notched-bar impact properties, but this is held to be a result of deoxidation with aluminum rather than melting practice.

The aluminum-killed steels also showed less strain age-hardening, which gave a fallacious advantage for the converter steels.

A limited number of standard fatigue tests showed a superiority in endurance ratio for the acid open-hearth and acid electric steels, but notched fatigue tests showed a notable similarity for all steels.

No evidence was found to favor one process over another, except that the basic open hearth gave better phosphorus control. Mechanical or engineering properties of all the steels were governed by composition and by deoxidation, rather than by melting process. For example, acid electric cast steel not having had an adequate aluminum addition shows low-temperature impact shortcomings, just as converter steel would without an adequate aluminum addition. When low-temperature shock resistance is needed, it would be in order to impose a low-temperature notched-bar impact acceptance test. If this be done and steel be passed or rejected on performance rather than on the melting process used, some steel now being accepted but not of good low-temperature toughness would be excluded and much good converter steel would be made available.

With proper deoxidation, all the processes can make steel of the quality demanded for war purposes.

References

(1) C. E. Sims and F. B. Dahle, "Effect of Aluminum on the Properties of Medium Carbon Cast Steel," *Transactions*, American Foundrymen's Association, Vol. XLVII, pp. 65-132, 1938.

(2) C. E. Sims and G. A. Lillieqvist, "Inclusions—Their Effect, Solubility and Control in Cast Steel," *Foundry Trade Journal*, Vol. 47, August 11, 1932, pp. 77-82. *Transactions*, American Institute Mining and Metallurgical Engineers, Vol. 100, p. 154 (1932).

(3) H. W. Gillett, "Impact Resistance and Tensile Properties of Metals at Subatmospheric Temperatures," Project 13, Joint A.S.M.E.-A.S.T.M. Research Committee on

SERVICE TO FOUNDRYMEN SINCE 1903

PRACTICAL FOUNDRY ADVISORS

KAWIN SERVICE

Would you **be interested in increasing your profits without the necessity of capital or any other type of investment? KAWIN offers you this opportunity.**

Our foundry service is offered on a definite basis—a guaranteed basis of liberal savings over any compensation asked. We have a well-rounded group of men skilled in control, production, and operating problems, have functioned for foundries all over the country for the past 38 years.

A CO-OPERATIVE SERVICE

The installation of our service is in NO way a reflection on your own personnel—we cooperate with your staff, assisting them with an outside viewpoint and our specialized experience on foundry problems. For instance, we check your operations completely from the point of cooperating with your purchasing agent in the use of less expensive materials, on through to finished castings.

We invite you to write us or, if you wish, we shall be glad to have a Kawin Representative call and show you how this service may fit into your picture. No obligation, of course.

Chas. C. Kawin Company

Chemists—FOUNDRY ENGINEERS—*Metallurgists*

CHICAGO—431 So. Dearborn **BUFFALO—110 Pearl St.**

Effect of Temperature on The Properties of Metals, p. 33, American Society for Testing Materials (1941). (Issued as separate publication.)

(4) C. H. Herty, Jr., and D. L. McBride, "Effect of Deoxidation on The Impact Strength of Carbon Steels at Low Temperatures," *Cooperative Bulletin* 67, Carnegie Institute of Technology and Mining and Metallurgical Advisory Boards, 52 pp., (1934); Abstracted in *Metals and Alloys*, Vol. 6, March, 1935, pp. 71-77.

(5) A. B. Kinzel, Walter Crafts and John J. Egan, "Fine Grained Structural Steels for Low-Temperature Pressure Vessel Service," *Metals Technology*, Vol. 4, April, 1937, 24 pp.

(6) S. L. Hoyt, "Notched-Bar Testing and Impact Testing," *Proceedings*, American Society for Testing Materials, Vol. 38, Part II, p. 141 (1938).

(7) D. J. McAdam, Jr., and R. W. Clyne, "The Theory of Impact Testing: Influence of Temperature, Velocity of Deformation, and Form and Size of Specimen on Work of Deformation," *Proceedings*, American Society for Testing Materials, Vol. 38, Part II, p. 112 (1938).

(8) H. W. Russell, "Effect of Low Temperatures on Metals and Alloys," Symposium on Effect of Temperature on the Properties of Metals, p. 658, American Society for Testing Materials (1931). (Issued as separate publication.)

This article is from a paper presented by the authors at the annual meeting of the American Society for Testing Materials held in Atlantic City, N. J., on June 22 to 26.

THE EDITORS.

Book Review

Machine Shop Yearbook and Production Engineer's Manual; edited by H. C. Town; cloth; 543 pages, 5½ x 8¼ inches; 410 illustrations; published by Paul Elek Ltd., Africa House, Kingsway, London, W.C.2, England.

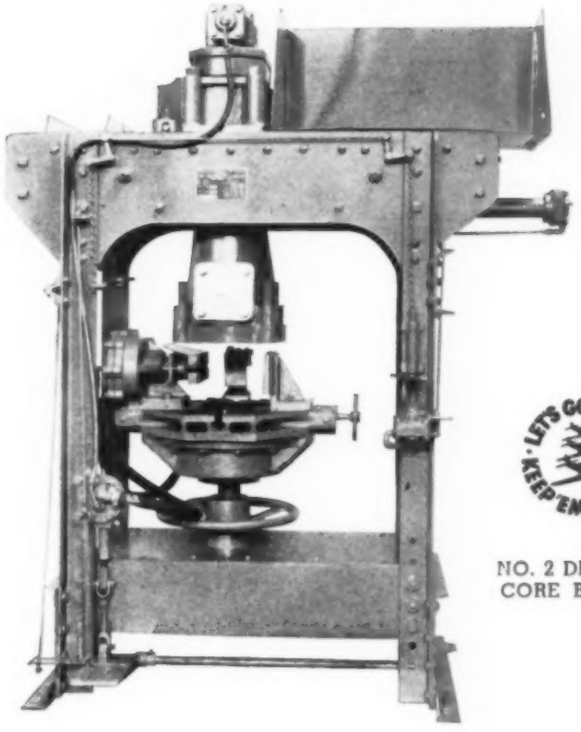
By the use of type approximately half the size used in ordinary publications, the publishers have succeeded in presenting an encyclopedia in one volume. The volume contains a fund of valuable information arranged in such a manner as to make it available for reference in connection with many of the problems which present themselves to those who take a real interest and pride in their work. The book is divided into three sections. The first has chapters devoted to machinability, application of electric control gear to machine tools, Canadian machine tools for guns and shells, diamond tools in modern industry, pitch testing of gears, grinding, planing, shaping and slotting machines, and synthetic rubbers and engineering. Part 2 covers power transmission, electrical equipment, hydraulic equipment, lathe cutting tools, lathes, capstan and turret lathes, drilling and boring machines, milling machines, gear cutting machines, reciprocating machine tools, grinding machines, precision finishing machines, sawing equipment, presses, workshop equipment. Seven chapters in the third section deal with jigs, fixtures and gages, testing and measuring equipment, engineering materials, maintenance and design, machining and production processes, etc.

Production Record Shown in Pictures

Building Production Morale is the title of a 40-page pictorial record of war production operations and morale methods recently issued by the Northern Pump Co., Navy ordnance plant, Minneapolis. In a foreword, John P. Hawley, president, states that the booklet was prepared and published at the suggestion of Rear Admiral W. H. Blandy, Chief of the Navy Ordnance Bureau. Over 100 pictures explain the methods used by the management, the workers, and the naval personnel at the plant in developing the high morale which won the coveted Navy *E* for excellence in production. The booklet is being distributed to all companies, organizations and individuals charged with war production responsibility including the 7000 employes in the plant. Copies are available on written request to the United States Navy, Branch Public Relations Office, Minneapolis, or Northern Pump Co., Columbia Heights Branch Post Office, Minneapolis.

★ ★ ★ 32nd YEAR ★ ★ ★

DEPENDABLE **CORE BLOWING** EQUIPMENT



NO. 2 DEMMLER CORE BLOWER

This standard machine is suitable for a wide range of core work in gray iron and malleable shops. Built into it are years of practical experience working with foundrymen . . . its high efficiency and simplicity of operation assure the SPEED and ACCURACY so necessary in today's drive for immediate production. It will give you long, satisfactory service with little attention. Investigate the possibilities of this and other standard and special machines made by WM. DEMMLER & BROS., KEWANEE, ILLINOIS.

DEMMLER

CORE BLOWERS *Exclusively*

CASTING SILICON BRONZE ALLOYS

(*Continued from page 87*)

with considerable advantage.

Silicon bronzes cast well with the usual types of molding and core making sands, used for other nonferrous alloys as gunmetal, phosphor bronze and manganese bronze, and ordinary facings as lithite and plumbago give good results when used with green sand or dry sand molds. However, care should be taken to ensure ample permeability, as impermeability produces skin porosity.

Silicon bronze castings are clean when removed from either green or dry sand molds, providing an unduly high casting temperature is avoided. Castings removed from the molds while red hot will not scale unduly in the atmosphere.

It is understood that contamination of the tin bronzes, and of gunmetal in particular, by silicon bronzes may occur in mixing machine-shop turnings and borings, etc., and that it is particularly detrimental to the properties of remelted gunmetal. While careful supervision of scrap is the obvious solution to this problem, in the event of accidental admixture occurring, silicon bronzes can be identified from other alloys by a simple test described in the appendix.

Cast silicon bronzes are readily weldable by the autogenous acetylene or arc methods, and castings containing sand-holes or blow-holes can be salvaged readily by welding these defects. When oxy-acetylene welding, a distinctly oxidizing flame should be employed, rod or wire of the same composition being employed. A suitable flux is composed of 9 parts fused borax and 1 part sodium fluoride.

The previous general data on silicon bronzes refer particularly to P.M.G., marketed by Vickers-Armstrongs, Ltd., and Everdur, marketed by I.C.I. (Metals), Ltd. It will be appreciated that, as these two alloys were developed independently, certain differences may arise in practice, and some further details of their individual properties follow:

Spread Charcoal Over Surface

The preferred composition of P.M.G. metal within the specification range, and the one to which the alloy is supplied normally is as follows:

Si	3.0 to 4.0 per cent
Fe	1.4 to 2.0 per cent
Mn	1.0 per cent maximum
P	0.1 per cent maximum
Zn	1.5 to 2.5 per cent
Cu	Remainder

Typical mechanical properties are as quoted under the general information for silicon bronzes: The freezing range is 950 to 900 degrees Cent. At the higher temperature the alloy is completely fluid. During melting, a precautionary measure against oxidation is to spread charcoal over the surface of the molten metal. In all melts, a small quantity of phosphor copper, say ¼ pound to 100 pounds, assists deoxidation. Sal-ammoniac is a good flux to use prior to casting.

Segregation of scrap, as mentioned generally for silicon bronzes, is of particular importance in reference to tin and lead contamination, which should be avoided. Iron, manganese and zinc contamination are, however, not detrimental. Repeated remelting can take place with very small melting loss. P.M.G. is particularly suitable for marine engine castings, especially those for which high test pressures are specified. Its corrosion resistance is good for general marine specifications, being superior to gunmetal against sea-water corrosion and marine atmospheres.

The typical chemical composition of

HOW TO BAKE CORES BETTER AND FASTER

● Most important in core baking is the uniform distribution of heated air in sufficient volume, at the right temperature, to all the cores (or molds) so that moisture in the cores may be removed from the inside out and the oils and other binders may be thoroughly oxidized to produce firm, strong, dry cores. Here's how to get the desired results:

1—Place the cores on shelves, racks, cars or any other handling medium in the oven so that the heated air is permitted to flow over the surface of every individual core.

2—Apply the converted heat to the cores gradually, keeping the pores of the sand open until all the moisture is removed and the sand thoroughly hardened.

3—Make sure that the heat is applied uniformly to all parts of the oven in conformance with the nature of the work load, eliminating any temperature gradient and providing for plenty of large air changes.

4—Assure adequate ventilation and, wherever possible, provide temperature and safety controls to make the baking operation as near perfect as possible.

5—If possible, have the heated air recirculated from the oven back through the heater or combustion chamber. This cuts heating time and fuel consumed and aids in uniform baking and hardening of cores.

With these considerations in mind, the selection of fuel, oven type and size, heating and handling systems must fit the foundry's particular requirements.

For Good Foundry Oven Practice—It's All in the "Know-How".

Write for this Free Book

THE GEHNRICH CORPORATION

42-11 35th Street · Long Island City, N. Y.

Everdur for sand castings is as follows:

Si	3.0 to 4.0 per cent
Mn	0.5 to 1.5 per cent
Zn	0 to 1.0 per cent
Impurities	0.5 per cent maximum
Cu	Remainder

Typical mechanical properties as cast are as follows:

Ultimate tensile stress	23 tons per square inch
Elongation	18 to 25 per cent on 2 inches
Izod impact strength	30 to 60 foot pounds
Brinell hardness	70 to 95

When annealed for half an hour at 700 degrees Cent. (1292 degrees Fahr.) and slowly cooled, the following properties are observed:

Ultimate tensile stress	22 to 26 tons per square inch
Elongation	22 to 30 per cent on 2 inches
Izod impact strength	40 to 55 foot pounds
Brinell hardness	65 to 90

The freezing range of Everdur is 950 to 1000 degrees Cent. (1742 to 1832 degrees Fahr.) at the latter temperature the alloy is completely fluid. In melting Everdur, it is advantageous to employ oxidizing atmosphere in order to preclude the possibility of gas pick-up, and for this reason a charcoal cover to the melt must be avoided. Everdur is not unduly detrimentally affected by the presence of small amounts of the normal types of impurities.

Lead Improves Machinability

For example, the presence of lead somewhat increases machinability, while aluminum adversely affects the weldability but increases the tensile properties. Amounts of tin up to 1.0 per cent also can be present in this alloy without giving any adverse properties. It will be noted from the typical composition that zinc may be present in moderate amounts as an intentional addition.

Consequently segregation of Everdur scrap from the bronzes and brasses in order to avoid contamination of the former, while desirable, is not essential. However, as has been outlined in the general description of silicon bronzes gunmetals are affected detrimentally by the presence of silicon.

The ductility, toughness and resistance of the metal to pressure may be improved by a simple annealing for ½ to 2 hours at 700 degrees Cent. (1292 degrees Fahr.), followed either by quenching or slow cooling. A further advantage of annealing is that casting strains also may be removed. Everdur is an alloy which was developed primarily for use in chemical manufacture, and as such has been in use for 15 years. The alloy is superior to copper in resistance to corrosive materials whether solid, liquid or gaseous. It exhibits particularly good resistance to seawater corrosion and marine atmospheres.

The heaviest casting known to have been made in this country in Everdur was a bowl for chemical plant weighing approximately 11 cwts. (1232 pounds). On the other hand small parts made for multiple running are being produced equally successfully for aero-engine parts, a high rate of production being achieved with total rejections as low as ⅛ per cent.

Appendix

Rapid Workshop Test For Distinguishing Between Silicon Bronzes And Other Bronzes And Brasses In The Form Of Machine Swarf

The following simple tests have been devised to distinguish between silicon bronzes and certain other alloys, particularly gunmetal.

In the nitroprusside test, two solutions are required: (1) A 5 per cent aqueous sodium nitroprusside solution, and (2) A 5 per cent aqueous hydrogen peroxide solution. Five volumes of 20 vol.

DAYTON
CORE
OILS
Uniformity of Dayton Oils assures exact duplication of "that last order"... tremendously important under present conditions when 100% production is so essential.
When better oils are developed they will bear our name.
THE DAYTON OIL CO., Dayton, Ohio
The DAYTON OIL CO.
DAYTON, OHIO
MAKERS OF DOCO BINDER & CORE PASTE • DOCO STEEL CORE & MOLD WASH

hydrogen peroxide diluted to 100 vol. with distilled water.

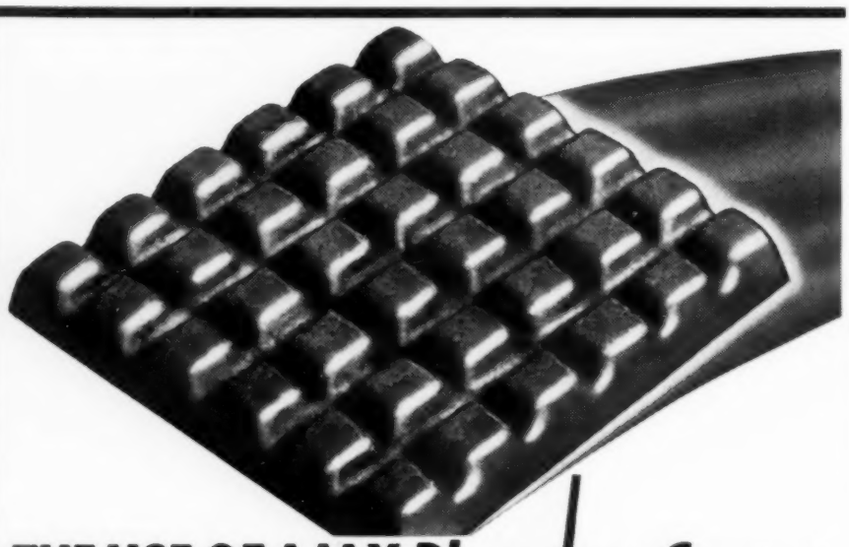
Place a small portion of drillings or turnings in a test tube and cover with sodium nitroprusside solution. Hold the end of the tube over a bunsen flame until the solution boils, and maintain for 1 to 2 minutes, remove the test tube from the flame, and after a few seconds decant the solution from the drillings. Wash out the test tube with tap water without removing the drillings and add a small amount of hydrogen peroxide solution.

The surface of silicon bronze drillings immediately turns dark blue in color, while gunmetal is unaffected. This test will also differentiate silicon bronzes from 95-5 tin bronze, manganese and aluminum bronzes, and the brasses such as 97-3, 90-10, 70-30, aluminum, Admiralty and high tensile. Copper and cupronickel also give the reaction with sodium nitroprusside, but these are unlikely to be confused with silicon bronzes.

A convenient and simple method of distinguishing between silicon bronzes and certain other alloys is by means of a spot test involving the use of ammonium sulphide solution. With this reagent both silicon bronzes and gunmetal give a black stain when a spot of the solution is applied, but this is not shown with brasses containing manganese, aluminum or tin, or the manganese and aluminum bronzes. Copper and 97-3, 90-10, brass give a black stain with ammonium sulphide, and this reagent therefore is used best in eliminating certain classes of material before applying the nitroprusside test.

This article is taken from the *Reports on Low-tin and Tin-free Bronzes and Brasses* prepared by members of the Nonferrous Subcommittee of the Technical Committee of the Institute of British Foundrymen, and presented at its thirty-ninth annual conference held in London on June 20. The second part of the report dealing with properties of low-tin gun metals and brasses will appear in a forthcoming issue.

THE EDITORS.



THE USE OF AJAX *Phosphor-Copper*

Send for booklet
"INGOT METALS OF TODAY"

●

15 STANDARD ALLOYS BY AJAX

Ajax Tombasil
Ajax Plastic Bronze
Ajax Anti-Acid Bronze
Ajax Phosphor Bronze
Ajax Red Brass Ingots
Ajax Manganese Bronze
Ajax High-Tensile Manganese Bronze
Ajax Golden Glow Yellow Brass
Ajax Nickel-Copper 50-50%
Ajax Manganese Copper
Ajax Aluminum Alloys
Ajax Phosphor Copper
Ajax Silicon Copper
Ajax Nickel Alloys
Ajax Phosphor Tin

NOTE

"Proper Melting Decreases Foundry Losses," contains interesting data. Also, the booklet, "Nonferrous Ingot Metals of Today." Write for both of these. They are free.

Successful foundrymen deoxidize or "clean up" molten metal by a scientific method worth using *as indicated:*

They use phosphorus . . expertly . . in the form of "Ajax Phosphor-Copper" . . added as the crucible is removed from the furnace . . for virtually all brass and bronze alloys.

In notched waffle sections, or in shot form, Ajax 15% P-Cu does its work at .01% (1 oz. per 100 lbs.). Introduced, and having time to react when stirred with a whirling motion of the skimmer, it causes oxides to rise for effective removal by skimming from the surface. It is best to avoid phosphorus build-up from back stock.* . . If you use phosphorus these days, use Ajax Phosphor-Copper (useful also in producing your phosphor bronze).

THE AJAX METAL COMPANY
ESTABLISHED 1880 PHILADELPHIA

ASSOCIATE COMPANIES:
AJAX ELECTRIC FURNACE CORPORATION, *Ajax-Wyatt Induction Furnaces for Melting*
AJAX ELECTROTHERMIC CORPORATION, *Ajax-Northrup Induction Furnaces for Melting, Heating*
AJAX ELECTRIC COMPANY, INC., *Electric Salt Bath Furnaces*
AJAX ENGINEERING CORP., *Aluminum Melting Induction Furnaces*

Adventures of Bill

(*Concluded from page* 113)

garage and chicken house and rigged up as nice a little foundry as you have seen any place. The lower floor is a general storage for sand, metal, coke and miscellaneous equipment and supplies. It also serves as a shipping room for the castings. The upper floor has the home-made melting furnace, above the floor, and with a stovepipe sticking out through a hole in the wall. Molds are made in a couple of snap flasks on a bench. The little crucible supplies metal fast enough to pour each batch of molds before the floor space is crowded.

"What's in a name, hey? Plenty, my boy, plenty. That which we call a rose, by any other name would smell as sweet. In the present instance, the name has a patriotic implication, but below that the incident shows something else. It goes to prove the truth of another old saying, 'Once a molder, always a molder.' Perhaps the present emergency will serve to show a certain class of employers that they are overlooking a bet when they restrict the hiring age to 40 or 45. They might ponder with profit the old saying, 'An old dog for a long hard road.'"

"To make the collection complete," I said, "You should not omit what perhaps is the best known of all old foundry sayings, 'Nobody ain't never seen a dead molder, a dead donkey, or a dead'— Just so. You are familiar with the triology."

Republic Coal & Coke Co., Willoughby Tower, Chicago, recently opened a branch office in Cincinnati. Ray T. Patton will be district manager of the office, which is located in the Union Trust Building. This company also maintains offices in Peoria, Minneapolis, Indianapolis, Milwaukee, St. Louis, Detroit, New York, Cleveland and Cincinnati.

FOUNDRY KEEPS 'EM ROLLING

(*Continued from page* 86)

construction and operation feature, a description of one will serve for both.

The conveyor differs in many respects from the conventional foundry type where the entire load is actuated by a single motive power unit. In the present instance four trains of 18 plates or mold holders are pulled by small electric locomotives operated on the third rail principle. This arrangement permits the trains to halt temporarily at the molding station, the pouring station and in the cooling tunnel. At the shakeout station an automatic switch diverts the locomotive and train to a section of the conveyor where the load is moved slowly by reduction gear, chain and sprocket to give the shakeout operator opportunity to dump molds and castings into a chute and screen and onto a belt which carries the castings on the first lap toward the tumbling barrel. The sand falls through the screen to a second belt which conveys it to a storage hopper.

Castings are Divided

The chute over the screen is divided in the center. Light, fragile castings go through one division, while the remainder, plain and strong, go through the other on their way to the continuous tumbling barrel supplied by the N. Ransohoff Co., Inc., Cincinnati. A mark on the cope tells the shakeout man which molds enter the fragile chute. A belt conveyor under the floor and running at right angles to the mold conveyor lines serves both conveyors. This feature is shown near the extreme right Fig. 1.

By the time the last molds on the train are dumped, the locomotive at the head of the train has advanced on the second leg of the conveyor to a point approximately opposite the shakeout and the last car is clear of the chain drive. The locomotive then automatically makes contact with the third rail and moves at greatly accelerated speed to the area served by the molding machines, where it halts for 4½ minutes while the molders are placing the molds on the plates. Automatically at a given signal the train moves forward to the pouring station where it again halts for 4½ minutes. When the molds are filled with metal, the train again travels rapidly around the turn and into the cooling tunnel, where it remains stationary for another 4½ minutes. Then it moves forward again on the last lap of the journey to the point where the switch diverts the train to the short chain driven section where the molds are shaken out.

The entire cycle is controlled automatically and the speed if necessary may be set in advance to meet variation in the mold production unit. Under present production program the 4½ minute time intervals are most efficient. While the movement of only one train is described, the conveyor has accommodation for four trains which follow each other in orderly sequence. Total length of the elliptical conveyor is 670 feet. Each train makes 88 round trips per day, with a resulting production for the entire system of 11,000 molds. As stated previously, miscellaneous castings are made by 35 molders on side floors and are not included in the foregoing total. The daily heat is approximately 80 tons.

Sand from the shakeout is carried aloft in a bucket type elevator and discharged through a revolving screen into a storage hopper from which it is fed as required to muller type mixer and

ANOTHER *Maehler Furnace*

for NORRIS STAMPING makes 12

THE first Maehler equipment in the plant of the Norris Stamping and Manufacturing Co., Los Angeles, was a continuous oven for baking enamel on license plates. The success of this installation led to Maehler Ovens for normalizing brass shell casings. Almost 100% uniformity of temperature throughout the furnace plus high capacity told the story of Maehler superiority. Additional orders followed one after the other including furnaces capable of producing temperatures for stress relieving steel shell cases. Now the total is 12 Maehler Furnaces at Norris—an outstanding testimonial to equipment performance and customer satisfaction.

93.6% OF MAEHLER'S PRODUCTION IS DEVOTED TO REPEAT ORDERS . . .

• There is no better proof of the superiority of Maehler Ovens and Furnaces.

THE PAUL MAEHLER CO.
2200 W. Lake St., Chicago, Ill.

MAEHLER

then to a belt which carries it over the center of the molding station. A series of plows divert the sand to the various hoppers over the molding machines set up on both sides of a central gangway as shown in Fig. 4. Through bond, permeability, moisture content and grain size tests carried out in a well equipped laboratory, the quality of the sand is closely controlled. An excellent paper on this phase of operation was presented at the 1942 Cleveland convention of the A.F.A. by D. F. Sawtelle, Malleable Iron Fittings Co.

To describe further the intermittent operating tumbling barrel, hot castings from the shakeout are carried on an inclined, two speed, slat conveyor and discharged into the revolving barrel 5 feet diameter and 38 feet in length. Here they are subjected to the combined action of boiling water solution of soda and hard iron stars. Rotation of the barrel, automatically reversed every 20 minutes, discharges the castings on to a long conveyor where several men remove gates and scrap and throw these parts into chutes at one side leading to a number of inclined bottom bins. The accumulation of miscellaneous scrap later forms part of the cupola charge. Heat in the castings evaporates all moisture. The stars fall into an inner chamber for reuse, and the spent sand falls into a water tank, from which it is ejected automatically into steel buckets.

From the high conveyor the castings descend to a long belt at convenient height running through the sorting and inspection room where the castings, according to their various characteristics, are placed by hand in a number of small tote boxes which travel on roller conveyors to the annealing department. Here they are placed in annealing boxes or pots stacked four high, run under a pair of flexible tubes, and packed with gravel. The pots are then sealed with mud and placed in the long battery of 13 annealing ovens by a lift truck.

Stacks Are Shaken Out

After the castings are annealed they are removed and carried one stack at a time to a special shakeout device. The lift truck places them in a small exhaust connected chamber shown in Fig. 7. Clamps engage the stack and hold it in position while the truck backs away temporarily. Contents of the pots fall on to a vibrating screen. The packing material falls through and is lifted by a bucket elevator and returned to the reservoirs for further use. At regular intervals the fines are winnowed out. The castings travel on a conveyor to wheelabrators made by the American Foundry Equipment Co., Mishawaka, Ind., thence to final finish and inspection in preparation for shipment.

The melting equipment supplied by the Whiting Corp., Harvey, Ill., consists of two cupolas lined 42 inches, an air furnace with a capacity of 16 tons and a powdered coal unit. Each cupola is in blast on alternate days and delivers metal directly to the air furnace where the metal is refined and maintained at a temperature of 2800 degrees Fahr. The installation is shown in Fig. 9, with the air furnace in the center, the cupolas in the left background and the coal pulverizing unit at the right. Iron is tapped intermittently from the air furnace and flows alternately through a double branch spout into 250 pound ladles suspended from two monorails, one leading to the pouring station on the left conveyor and the other leading to the conveyor on the right.

A specially trained pouring gang handles the ladles and pours the metal into the molds directly from the 250 pound monorail ladles. To assist the pourers in gaging the speed of delivery and the amount of iron necessary, a gate of castings is set up on a stand opposite the point where the train of molds comes to temporary rest. Thus the pourer is

WORKING HARD

★

We're working hard to deliver chaplets and other foundry supplies that meet today's needs for better quality and service. We want to be of service. Write us for complete catalog, samples and prices.

★

Milwaukee

CHAPLET AND MFG. COMPANY

in position to pour the metal into each mold with the nicety and skill formerly exercised by the molder who poured his own work with a hand ladle. The pouring ladles supplied by the Modern Equipment Co., Port Washington, Wis. and shown in Fig. 9 are attached to the hoist by a single upright bail at one side. With no shank projecting on the opposite side, the ladles can follow each other closely under the furnace spout with practically no splashing of metal. Four ladles are filled from each tap with sufficient metal to fill each train load of 18 molds.

Each individual charge for the cupola, 2000 pounds of pig and scrap, 210 pounds of coke, and 70 pounds of limestone, is loaded in a dump box mounted on a truck provided with a registering scale. Return sprues, gates and scrap retrieved from the high conveyor belt referred to previously are collected in the row of bins shown in Fig. 5. The dump truck is spotted under one of the bins where the required amount of scrap, approximately 50 per cent of the charge, is loaded partly by gravity and partly by long rakes in the hands of the operators.

The loaded truck carries the charge about 20 feet and discharges into a skip bucket which carries the material to a point about 40 feet above the floor and spills it into a chute terminating at the charging door of the cupola. Chutes from the two cupolas meet at the top in a manner that permits the charge to be sent through either. With this mechanical charging equipment the truck driver and two assistants readily handle the daily heat of approximately 80 tons iron, 10 tons coke and 1600 pounds limestone.

Book Review

Iron Men And Their Dogs, by Ferdinand C. Latrobe; cloth, 225 pages 6½ x 9⅛ inches; published by Koppers Co., Bartlett Hayward Division, Baltimore.

The title of this cleverly written and highly readable volume, contrary to a deplorable modern tendency to use far-fetched titles, is a definite indication of the contents. The iron men are the individuals connected with the Koppers Co., Bartlett Hayward Division, and its long line of predecessors back to the original Hayward & Friend, stovemakers, 1837 to 1840. Reference to the iron dogs, and they are many, informative and entertaining, is based on the fact that the iron men always kept in mind the importance of judiciously combining work and recreation. Favorite sport was duck hunting in that shooter's paradise, Chesapeake Bay. Closely related features naturally included retrieving the birds, and the more important feature of cooking and eating them. In this latter feature these iron men developed a technique, and set up records that probably never have been equalled, and certainly never surpassed.

Cast iron replicas of two famous dogs, Canton and Sailor, were set up before the company's office entrance about 1850. When a new office was built in 1899 the faithful guardians were thrown on the scrap pile. This was nearly a fatal mistake. As pointed out by one of Mr. Hayward's descendants, "Short times came. The partners insisted that their luck had gone with their mascots. The dogs were retrieved and placed again at the office entrance where they may be seen down to this day." They brought back the firm's ancient good fortune, as easily may be read in the twentieth century ledgers.

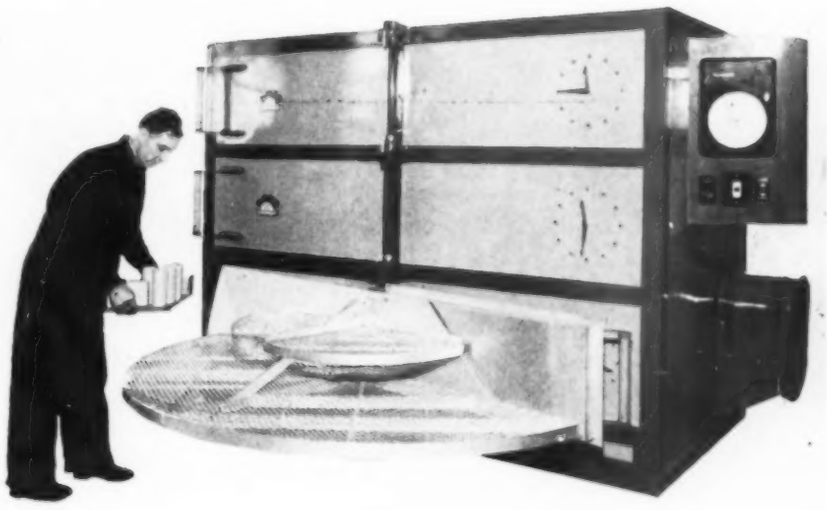
Subject matter in the book, illustrated by 38 highly interesting engravings, is covered under 19 chapter headings.

Lo-Hed Hoist Division, American Engineering Co., Philadelphia, has appointed the Eiler Equipment Co., 617 North Washington avenue, Minneapolis, as its representative.

GAS FIRED

RE—— CIRCULATING

ROTO DRAWER CORE OVEN



A STANDARD UNIT DELIVERED COMPLETE

The automatic control of the temperature of rapidly circulated and recirculated air insures a uniform temperature throughout the entire baking chamber—thus making possible a STEADY FLOW of cores perfectly baked in less time than ever before possible.

EIGHT WEEKS $1745 FOB

The three large drawers are 8'-0" diameter and have a capacity of over 1500 lb. of cores 14" high. The removable drawers are furnished either 4'-0" diameter (as shown) or 8'-0" diameter.

THE CLEVELAND BLOWPIPE & MFG. CO.

6505 Cedar Ave., Cleveland, Ohio

FOUNDRIES OPERATE UNDER WAR CONDITIONS

(*Continued from page* 83)

dark hours. The method employed for obscuring the work is simple. All glazing is tarred so that the daylight cannot come through, and screens are placed before doorways so that light cannot be seen when the doors are open. This means, of course, that the foundries and other shops always operate by artificial light. In certain cases ventilation methods have had to be modified and special louvres adapted to enable air to circulate without showing any light.

A special difficulty arises in regard to the glow that might be observable during the dark hours from cupolas, converters, drying ovens, etc. Certain mechanical devices have been devised to obviate this, but a simple and non-mechanical method is employed at these works. Above the cupola platform, or above the opening through which flames and gases are dispersed into the air, a sort of false roof has been erected with specially constructed louvres. The result is quite satisfactory and no glow can be seen at night.

Another difficulty may be mentioned, although it is not connected with the foundry. The operation of coal mines causes large heaps of refuse and shale to grow nearby the collieries. These heaps are liable to flare up owing to spontaneous combustion, and elaborate measures have to be taken to sprinkle the tips with water and sand to put the fires out and stop the glow.

All the air raid defenses that have to be adopted constitute a considerable expense. The company has spent about $200,000 on their scheme, including alterations to buildings, building of shelters, preparations for gas decontamination, fire fighting, training and equipment of the civil defense volunteers. The cost does not stop at capital expenditure, for there is a considerable amount of maintenance involved in keeping the scheme efficient, and extra lighting during the day also is an additional expense.

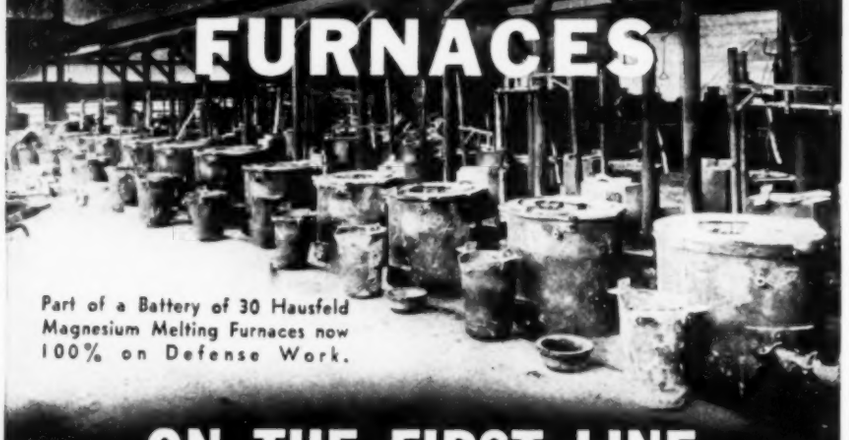
Employment of Women

Difficulties in regard to labor are due to the calling up of the young men. For certain jobs requiring skilled men, or physically fit men, a system of deferment is established, but it is difficult to keep men for many jobs that are important, and ordinary laborers are not easily deferred. One remedy to the situation is the employment of women, and the problem has been studied specially by the engineering director of the company, a descendant of one of the original founders, who has always taken the keenest interest in the welfare of his employes.

For many years past women have been employed in foundries, mainly for core making. They were not considered fit for other jobs because of the heavy weights that have to be lifted. However, the difficulty can be solved in certain cases by altering the layout of the foundry and by adopting certain special lifting devices. In the iron foundry, seven mobile sandslingers are to be replaced by two stationary units with gravity conveyors and sand conveying equipment. This change will economize a considerable amount of night work in preparing sand heaps for the next day's operations, and it will also enable women to be employed on certain jobs. In this same foundry a continuous knockout and sand preparing plant, comprising an excavation 27 feet deep and an underground alley 60 feet long and 12 feet deep by 8 feet wide, was built over last Easter between the Friday morning

HAUSFELD

MAGNESIUM MELTING FURNACES



Part of a Battery of 30 Hausfeld Magnesium Melting Furnaces now 100% on Defense Work.

ON THE FIRST LINE OF THE NATIONAL DEFENSE

Hausfeld Furnaces are stepping up production wherever non-ferrous alloys are required for defense work. • Faster melting accounts for some of this increase. Reduction of metal losses accounts for much of it. Heat after heat, day after day, the alloys are of uniform analysis. Rejects are few. Operation is continuous. • Thousands of foundrymen have approved the accuracy of Hausfeld machine work, the complete utilization of fuels, the longer life of linings, pots and crucibles, the greater ease and speed of charging and discharging. • Every Hausfeld Furnace, whether single or multiple burner, stationary or tilting, covered or open-top, whether for melting magnesium or other non-ferrous metals, is tested before it leaves the factory.

The Campbell-Hausfeld Co.

300-320 MOORE ST. HARRISON, OHIO

and the Wednesday evening. The extremity of the alley is in rocky ground that had to be blasted.

Reverting to the question of female labor, the new steel foundry was designed specially with a view to employing women. They do the coremaking and operate the battery of molding machines. They also drive the cranes. In this foundry, iron is melted in a cupola and transferred into a converter. Ferromanganese is melted in a cupolette and added into the ladle before the steel is poured from the converter. Plans are being made to use women at the converter station also. Women are not, so far, employed for pouring, fettling, or at the knock-out station, but 55 per cent of the workers are women.

The women's work at the coremaking station calls for little comment. The station is placed on the side of the molding station, and a little in front. The cores for the particular casting made are not large, and are carried in trucks to the vertical automatic heating ovens. They are then placed on racks, whence they are carried by hand, on boards, to the molding station. A man is in charge of the core heating oven.

Women Make Molds

The molding station, with a battery of six molding machines, is located at the end of a long gravity conveyor system which carries the molds to the pouring station and brings back the empty boxes. The boxes are 26 inches long by 18 inches wide, and it is here that special lifting and carrying devices have been provided for the women workers. On the whole station two men only are employed to supervise, and to place the empty boxes on the molding machines. The women molders drop the sand, fed by a sand belt conveyor, from hoppers, over the pattern plates and operate the jolt molding machines, which are situated about 10 feet from the line of conveyors. Between each molding machine and the main conveyor line is a short overhead double-track runway on which a lifting device can travel backward and forward. The device is simple and consists of two uprights ranging from the runways. Each upright ends with a flattened hook that slips under the handles of the molding boxes. Length of the uprights corresponds to the distance between the overhead runway and the table of the molding machine. As a result the mold is picked up by the device and pushed onto a movable section of the main roller conveyor system which is at a slight incline, so that a gentle push on the mold releases the handles from the hooks. The section of conveyor carrying the mold then is rolled back into place and the mold takes its position in the line, where it is cored up before being conveyed to the pouring station.

This is a good example of how work can be adapted to the use of female labor, the main object being to relieve women and girls from the effort of lifting heavy weights. The women in this foundry work quite satisfactorily and show a high sense of duty. They are quite adaptable. There is a welding school at the works for girls, and they learn quickly. Welding appears to be a very suitable job for women. The welfare question is very important in the case of women in a factory. In some works a specially trained woman is in charge of all welfare matters. At this company this duty is taken over by a hospital nurse. Separate dressing rooms and lavatories must be built, and there must be canteens where men and women take their meals together. All these amenities are provided for, and it is intended to appoint a full time medical officer to look after the health of the employes.

An interesting feature is that a network of loudspeakers located in the various shops is connected with the engineering director's office whence the

8 out of every 10 TRANSITE CORE PLATES are bought by steady, long-time users . . .

Experienced operators know that these non-metallic core plates are important factors in boosting production . . . and here are the reasons why:

EASY TO HANDLE—Lighter in weight than metal; operators can handle more plates with less effort.

STAY CLEAN—When both sides are used alternately, Transite Core Plates clean themselves.

HIGHLY RESISTANT TO CORROSION—because they are made of asbestos and cement.

STRONG—Fibrous; have unusual shock-resistance, minimize breaking and cracking.

REDUCE WARPAGE—Have a warpage tolerance as low or lower than metal plates.

ECONOMICAL—because of their low price, low handling costs and long life.

Because Transite Core Plates contain no critical materials, they help conserve materials for emergency services. Full details will be sent on request. Write Johns-Manville, 22 East 40th Street, New York, N. Y.

Johns-Manville
TRANSITE CORE PLATES

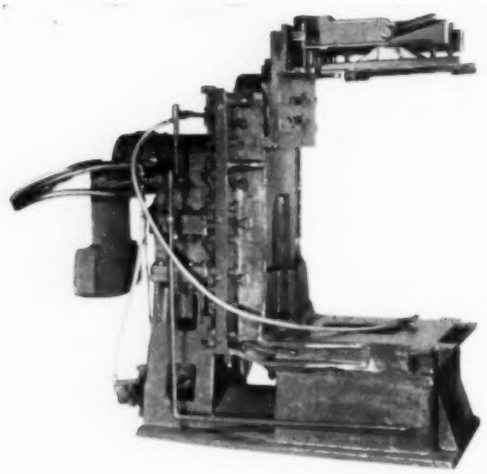
director can broadcast all through the works, or to one separate department, call managers, issue instructions, etc. During intervals of work talks on matters of interest are given and B.B.C. concerts also are broadcast. This is much appreciated by the workers.

In peace time certain strict rules were applied to the employment of women by the Trade Unions; these have been relaxed in war time and, for instance, no objection is made against women taking on men's jobs. Women's rates of pay are generally lower than men's wages but if a woman replaces a qualified man she is paid the same rate after a period of weeks during which she must qualify for the job. A slightly lower rate is applied where special devices have been provided to ease the work. Absenteeism for women has been found to be only slightly more than for men. At the entrance of the works the numbers of employes present and absent is posted up on a board and this appears to have a stimulating effect.

The features described in this article were introduced because of war conditions. Probably many will be found worth while retaining in peace time.

GRIMES
MOLDING MACHINES

HAND AND POWER ROLL-OVERS FOR CORE ROOM AND FOUNDRY



1000 lb. Capacity Jolt Roll-Over
22″ Pattern Draw

COMPLETE CORE SAND MIXING UNITS

WITH AUTOMATIC PROPORTIONING OF INGREDIENTS, ENGINEERED, FURNISHED AND INSTALLED

We are ready at any time to consult with you — WRITE or WIRE...

GRIMES MOLDING MACHINE SALES
1429 VIRGINIA PARK **DETROIT, MICHIGAN**

WPB Wants Crucible Scrap Saved

Fred L. Wolf, Chief, Graphite Section, Mica-Graphite Branch, Materials Division, War Production Board, Washington, recently sent the following communication relating to the conservation of graphite and carbon bonded crucibles:

Any waste or scrap that can be so treated as to recover material of a strategic nature must be saved.

Crucible scrap contains a considerable amount of graphite and silicon carbide that can be recovered and utilized.

The graphite situation is serious and every effort must be made to carry on an extensive conservation and reclamation program.

In anticipation of this program, we are requesting all users of graphite crucibles to save their crucible scrap and allow it to accumulate in any available space. Please segregate your crucible scrap into two classifications. Keep Tercod and Syncar crucible scrap separate from other crucible scrap.

It is probable that central stations will be provided where eventually the crucible scrap will be shipped for processing. No definite procedure has been established as this department is still engaged in investigating equipment and methods which might be used. Several of the crucible manufacturers are now operating reclamation plants to a limited extent and nothing in this letter infers that they should discontinue operating these plants.

Further information concerning this matter will be given at a later date. In the meantime, save your scrap!

Engineer's Booklet Points Way

A brief description of how scientific management, without adding materially to equipment or man power, has helped to increase production from 20 to 80 per cent is presented in a booklet, "More Production, Better Morale," recently issued by the Bedaux Co., Inc., Chrysler building, New York. The text considers proper planning and scheduling of operations, job evaluation and classification, plant layout, training of supervisors and workers, control of maintenance and repair operations, and control of costs. The statement points out that in applying these techniques it is essential to enlist the workers' collaboration. Open and frank procedures and full explanation of all practices assure full co-operation of supervisors and workers. Labor participation is stimulated by assigning experienced workers to make studies of operations. It is claimed these principles are being applied successfully in both union and nonunion enterprises.

MAKING AIRPLANE CYLINDER HEADS

(*Continued from page* 77)

not be forgotten that considerably more floor area, parts and man-hours are required to make an airplane. In addition the production of planes must be integrated with the overall war material program calling for 45,000 tanks; 20,000 antiaircraft guns; 8,000,000 deadweight tons of shipping, not to mention thousands of trucks, half-tracs, jeeps and other mechanized units; machine guns; automatic rifles; heavy guns; almost inconceivable quantities of munitions of all types, etc.

Just as one example to indicate the difference between automobile and plane production, attention is directed to motors used in both, with the air-cooled, radial type airplane engine and 8-cylinder automobile engine as the bases. Horsepower of the plane engine is roughly 20 times that of the auto engine, while the plane engine weighs about 1.2 pounds per horsepower against that of 5 to 6 pounds per horsepower for the automobile engine. Cylinders of the auto engine are cast in one piece while those of the plane are made separately. Similarly the cylinder heads of the auto are made in one piece while the heads for the plane engines are produced separately.

Motor Has 14 Cylinders

The plane motor has 14 cylinders with corresponding parts such as valves, connecting rods, etc., while the auto has eight. Before leaving the subject it may be pertinent to say that while an automobile has only one engine, some planes, particularly the large bombers may have as many as four engines. Consequently, a great many more engines than planes have to be produced, not forgetting the advisability of having a few spares on hand just in case.

While many of the radial type airplane engine parts are produced by various methods of fabrication, the cylinder heads are cast of aluminum alloy made in dry sand or rather core molds. As may be seen from Fig. 7 the cylinder heads are rather intricate castings necessitating exacting workmanship to produce quality work. The numerous fins on the heads are for the purpose of presenting an increased surface area for cooling. The fins are about 1/16-inch thick at the periphery, tapering to about 3/32-inch at the base adjoining the cylinder wall. They are spaced about 7/32-inch apart or about 5 to the inch. The fins around the circumference of the head are about 3 inches deep, and the others vary from that to about 1-inch deep.

Brief reference to the fins will indicate to every foundryman a rather tricky casting subject to plenty of headaches. Such a casting results in considerable head wagging and the *Show me—I'm from Missouri* attitude when mass production is mentioned. But mass production of cylinder heads is an accomplished fact.

The Wright Aeronautical Corp., Paterson, N. J., one of the pioneer manufacturers of radial type, air-cooled engines, about a year ago completed a modern, up to the minute foundry for the mass production of cylinder heads which incorporated numerous ideas gained from long experience in that field. The foundry, located in the Middlewest, follows the best tradition of straight-line industrial procedure of bringing raw materials in the front door and shipping the finished product from the back door without any backtracking. The building of brick and steel sash construction, is well ventilated and well lighted both naturally and artificially.

Due to obvious reasons details as to construction, capacity and arrangement of equipment cannot be revealed, and

GKS
Core Baking Ovens
Victory will be the achievement of increased production . . . If your war contracts are being delayed by insufficient or inadequate core baking facilities, wire, write or phone for a GKS engineer at once.
Oil, gas or electric types available for reasonably prompt delivery.
GEORGE KOCH SONS, INC. Evansville, Indiana

it will suffice to say that present output exceeds by good measure the original plans. Likewise, only the sequence of operations without any data as to production rates can be described. However, the lack of such details will have little bearing to most readers since they are interested in procedures rather than statistics.

Molds for production of cylinder heads in the new Wright foundry are made of oil bonded core sands. Sands used include Pennsylvania glass and New Jersey silica of fine and medium grain size. They are brought to the foundry on a railroad siding extending along one side, and unloaded into underground storage bins. Sand from the bins is transported along a pit across the front of the foundry in tilting buckets on an electrically operated, overhead tramrail system to a skip hoist which elevates the sand to a balcony.

On the balcony the sand is mixed with core oil and cereal binder, if needed, in 1200-pound capacity mullers, as shown in Fig. 11. Moisture tests are conducted on every batch and physical properties are determined twice a day. Three sand mixtures are employed. One for facing is composed of a blend of fine and medium grain sands to give an average grain size of 112, a dry permeability of 50, tensile strength of 110 pounds per square inch, hardness of 94, green compressive strength of 1.2 pounds per square inch, and a transverse strength of 22 pounds.

Backing sand is composed of medium grain sand which shows a dry permeability of 85, a tensile strength of 138 pounds per square inch, a hardness of 92 and a transverse strength of 26 pounds. Sand for the internal cores is a fine silica sand bonded with oil and cereal binder. The dry permeability is 220, tensile strength 360 pounds per square inch, hardness 96, and transverse strength 63 pounds. Since that sand is used in core blowing machines, it must fill the core box properly, and the flowability value for the sand is 72.

After the sands are mixed, they are distributed in side dump cars to the various overhead hoppers at molding and coremaking stations. Molds for the cylinder head castings are composed of 4 parts comprising the cope, drag, slab core containing the gates and risers, and a pouring basin—all of which are made on molding machines. The copes and drags are similar in appearance except for the prints for valve openings, and are produced on jolt, rollover, pattern draw molding machines. The patterns are bronze and snap flasks are used.

Throw Sand Into Fins

Two operators make each cope and drag, and the first operation is to brush the pattern carefully and blow it off with a compressed air jet to insure removal of any loose sand particles. Then handfuls of facing sand are thrown on to the pattern with as much force as possible, so as to insure that the sand is driven to the bottoms of the fins. The sand is pressed down firmly by hand, and then rubbed down or struck off until the tops of the fins on the pattern are visible. Following those operations comes one upon which considerable depends—almost the success or failure of producing a good mold.

That operation is nailing the thin bodies of sand comprising the fins so that not only will they draw clean from the pattern, but they also will stand up under impact of molten metal poured into the finished mold. Fig. 8 is a bird's eye view of the nailing operation, and it may be of interest to mention that around 750 nails are used in each cope and drag mold, or a total of 1500. The nails are thin wires varying in length from 1 inch to 3½ inches in length and are inserted so that about ½ to ¾-inch projects above the pattern. Nails are placed about ⅛-inch apart, and when the operation is finished the pattern looks

YES 8 TO 10

Wash Simultaneously at ONE Bradley Group Washfountain

*Dermatitis—skin affection is said, by physicians, to be a serious factor in lost man-hours—and that sanitary washing is a recognized preventive

Time and space are saved by Bradleys—for 8 to 10 persons may wash simultaneously, each in his own clean running water for thorough cleansing of hands, arms, and shoulders.

Each Bradley Washfountain takes the place of 8 to 10 conventional "single-person" wash basins which means a reduction of 80 to 90 per cent in piping connections, thus saving in critical materials and in installation time.

The deep self-flushing bowls are continuously kept clear of water collection and possible contamination. They and their pedestals are constructed of precast stone and marble.

Bradleys have been the choice of leading industrial plants for many years and are used daily for the safe washing of over four million hands. Because of the greater congestion of employees today, their sanitary facilities are of more importance than ever before—to keep lost man-hours to a minimum. Our helpful Washroom Plan Booklet will be mailed on request... BRADLEY WASHFOUNTAIN CO., 2217 W. Michigan Street, Milwaukee, Wisconsin.

BRADLEY washfountains

like a porcupine or a hedgehog, as may be observed in Fig. 8.

After nailing more facing sand is thrown on the pattern and nails until they are covered completely, and then the snap flask is placed in position. Backing sand is shoveled in slightly above the top of the flask, jolted and butt rammed with hand rammers. Excess sand is removed with a strike, and the bottom board is clamped in position. The whole is raised, rolled over, and leveled off with the mold resting on the swing out table. The vibrator is started and after a few minutes the pattern drawing mechanism is put into operation slowly withdrawing the pattern very slightly from the mold. Drawing then is reversed so that the pattern goes back to its original position. When that is accomplished the real pattern drawing operation is begun.

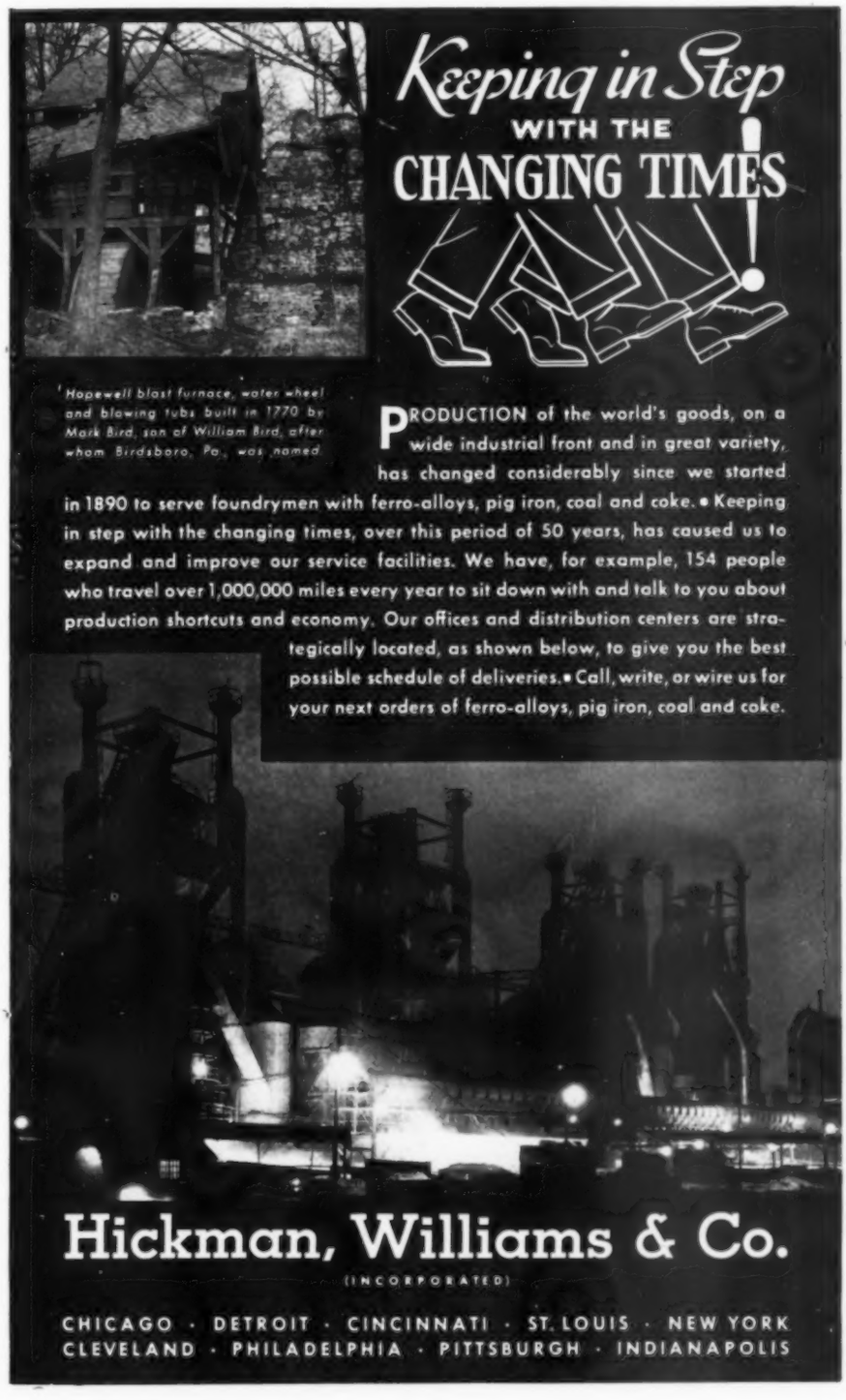
Pattern drawing is conducted very slowly to insure as nearly as possible a perfectly clean draw. Considering the long, thin wedges of sand forming the fins, the operation succeeds remarkably well. Now and then it is necessary to repair an edge of one of the fins, and the repair which is termed "buttering" is accomplished as neatly and skillfully as a surgeon performing an operation. As might be expected a pair of deft and steady hands is an essential requirement. The operator uses a pair of narrow slicks. On one he picks up a small dab of sand from a part of the mold which will not be affected by that loss. The other slick is held against the fin at the damaged section, and then the first slick containing the sand is brought into position so that the latter may be applied with a gently downward stroke. After the sand is in position the two slicks are manipulated, as shown in Fig. 2, to press it into place and give it the proper contour.

Finished molds are carried a few feet to a chain propelled core conveyor. The chain is overhead and carries core trays with 3 shelves about 36 inches square. Molds are carried to a continuous type oven, which is about 175 feet long and oil fired. Approximately 7 hours at a temperature of 450 degrees Fahr. are required for baking the molds. On emergence from the oven, the molds are placed on the floor to cool to room temperature before use.

Slab or end cores containing the downgate and risers are made of backing sand on molding machines. As may be observed in the center of Fig. 4 the wide downgate is divided by several heavy ribs to form a type of finger or channel gate which feeds directly into the rocker arm boxes of the cylinder head. The gate channels extend down to a wide passage with legs on each side forming the letter U. The legs, approximately 3 inches square, constitute the risers. Pouring basins shown at the left in Fig. 4, also made of backing sand, are produced on molding machines.

Main core in the cylinder head is the barrel core which is blown on machines. The core is made in two halves with the split on the longest dimension. Cores are placed on racks and dried in batch type ovens. Rocker box cores also are blown. After drying the two halves are pasted together, and rebaked. Then the cores are cleaned, checked to see that they meet specifications, and then sent to the mold and core assembly department where they are rechecked.

In assembling the mold halves and cores the first operation is smoking the mold face, as shown in Fig. 6. That is accomplished with an acetylene torch which uses no oxygen or air and this results in a yellow, smoky flame. The operator places a drag on the bench at his right and a cope at his left. Drag mold face is smoked, and then the rocker box cores, barrel core, and pencil cores forming the valve guide holes are placed in position in that order. The cores are gaged for location and then are smoked. The drag mold with its cores is lifted from the assembly bench and placed on

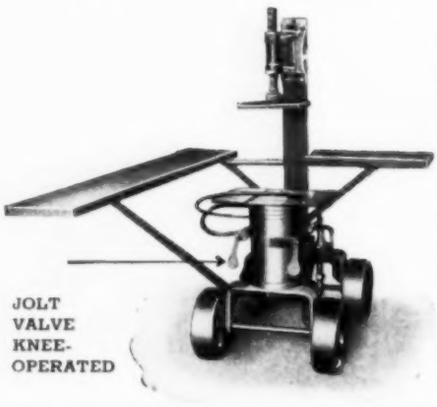

Keeping in Step
WITH THE
CHANGING TIMES!
Hopewell blast furnace, water wheel and blowing tubs built in 1770 by Mark Bird, son of William Bird, after whom Birdsboro, Pa., was named
PRODUCTION of the world's goods, on a wide industrial front and in great variety, has changed considerably since we started in 1890 to serve foundrymen with ferro-alloys, pig iron, coal and coke. • Keeping in step with the changing times, over this period of 50 years, has caused us to expand and improve our service facilities. We have, for example, 154 people who travel over 1,000,000 miles every year to sit down with and talk to you about production shortcuts and economy. Our offices and distribution centers are strategically located, as shown below, to give you the best possible schedule of deliveries. • Call, write, or wire us for your next orders of ferro-alloys, pig iron, coal and coke.
Hickman, Williams & Co.
(INCORPORATED)
CHICAGO · DETROIT · CINCINNATI · ST. LOUIS · NEW YORK
CLEVELAND · PHILADELPHIA · PITTSBURGH · INDIANAPOLIS

IMMEDIATE DELIVERY
on the
NEW
"RAPID" HAND SQUEEZER

Will handle a lot of your bench jobs and save you money by trebling your production.
Handles flasks up to 16 x 30 inches.
Comes complete with benches.
Portable or Stationary Type.

★

"RAPID" R9X JOLT
30% increased jolt capacity



A Foundry producer of good molds for over 20 years.
Simple to operate.
Squeeze Plate quickly adjusted.
Low initial cost.

★

Write for NEW descriptive folders and Price Lists.

PIONEER
MANUFACTURING CO.
Molding Machine Manufacturer for Over 20 Years
MILWAUKEE (West Allies) WISC.

a low bench in front of the roller conveyors, shown in Fig. 1. Assembly benches in that illustration are at the back.

The cope mold is smoked, lifted from the bench and placed in position on the drag. Three bosses on the drag, as may be observed in Fig. 6, and similarly located depressions in the cope, eliminate guesswork as to proper relationship between drag and cope. The slab core is placed on the cope and the three parts are clamped together. All joints are sealed with a clay and slurry mixture. The complete mold then is upended, the pouring basin set in position and sealed with the clay and slurry mixture. Following that the mold is placed on a board skid on the roller conveyor, as shown in Fig. 1, and is ready for movement to the pouring station. Molds on the skids are pushed by hand along the roller conveyors, as illustrated in Fig. 10.

Melted in Oil Furnaces

The aluminum alloy used for the cylinder heads is melted in tilting type, oil-fired furnaces shown in Fig. 5. The furnaces have a capacity of 1000 pounds. Iron pots coated with lime wash to reduce iron absorption to a minimum, are used. Thermocouples located in the metal bath permit observance of the temperature at all times. Procedure in melting is to bring the aluminum alloy up to 1200 degrees Fahr., and then flux with chlorine gas for several minutes. Following that the temperature is increased to 1400 degrees and maintained at that temperature during pouring. Molten metal is conveyed to the pouring station in 100-pound capacity ladles transported on an overhead tramrail system. With each 12 cylinder heads poured from the furnace a set of test bars also are poured. Those are forwarded to the heat treatment department and put through with the particular lot of cylinder heads. The bars after heat treatment are sent to the metallurgical department for testing.

Any smoke, fumes and heat are removed by a large hood erected over the furnaces, which is attached to a powerful exhaust system. Similarly the pouring station, located as it is between incoming molds ready to be poured and outgoing molds to be cooled, is separated from the rest of the foundry by corrugated steel walls and roof. The walls extend down to within a few inches of the pouring basins and the mold, and several openings in the roof conduct the fumes and heat to the exhaust system.

This is the first of two articles describing the production of cast aluminum alloy cylinder heads for rotary, air-cooled engines. The second will appear in a forthcoming issue.
THE EDITORS.

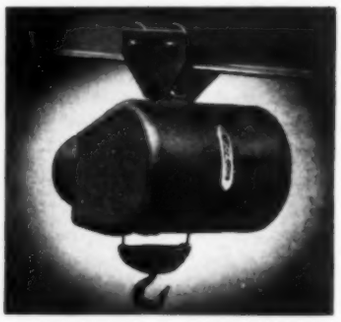
The CONCO JIB CRANE

★ ★ ★

Ideal For Foundry Work

This Conco Self-Supporting Jib Crane revolves in a complete circle, with minimum effort. The large diameter radial rollers, front and rear, are equipped with anti-friction bearings and in addition a ball thrust bearing is provided to take the vertical thrust load. Ideal for foundries because it requires only the floor space occupied by its base, yet covers a large area. Write for illustrated bulletin.

CONCO TORPEDO ELECTRIC HOIST



Available in capacities of 250-lb. at $139.50, 500-lb. at $149.50, 1000-lb. at $159.50. Features include double-drum construction, push button control, electric brake, limit switch, and hook, bolt or trolley suspension. Write for literature.

CONCO
ENGINEERING WORKS
Division of H. D. Conkey & Co.
19 GROVE ST. • • MENDOTA, ILL.

METALLURGIST AND THE STEEL FOUNDRY

(*Continued from page* 81)

First, a control over melting operations which results in greater regularity; second, economy of expenditure, both in the use of suitable materials and the melting methods employed; and, third, a superior product at the shipping end of the shop, as the result of the provision of steel especially suited to foundry requirements.

It often has been said that the steel for castings must be made, and not merely melted. If this is to result it is essential that a knowledge of all the reactions involved in the steelmaking process, as complete as present fundamental knowledge permits, is possessed by the men in charge.

Reactions Are Important

Steelmaking is really founded upon high temperature chemistry, a process of subjecting a bath of molten metal to an orderly and controlled series of chemical reactions. If these reactions are out of step, or not quantitatively accurate, the ultimate material not only may be of incorrect composition, but also entirely inadequate to produce a sound steel casting. The steelmaker must keep in mind that molten steel, when poured, will be subjected to a number of seriously unbalancing effects as the result of mold and core conditions, particularly if the latter are made of green sand containing an appreciable amount of moisture.

Therefore, the steel must carry a margin of safety, and this is a matter just as much related to condition as to chemical analysis.

It is well known that the bath of molten steel, through its manufacturing process, is covered entirely by a blanket of slag, and the connection between the constitution of this slag and the underlying metal is a vital factor in the process. Most of the chemical reactions taking place are in the nature of mutual activities between slag and metal.

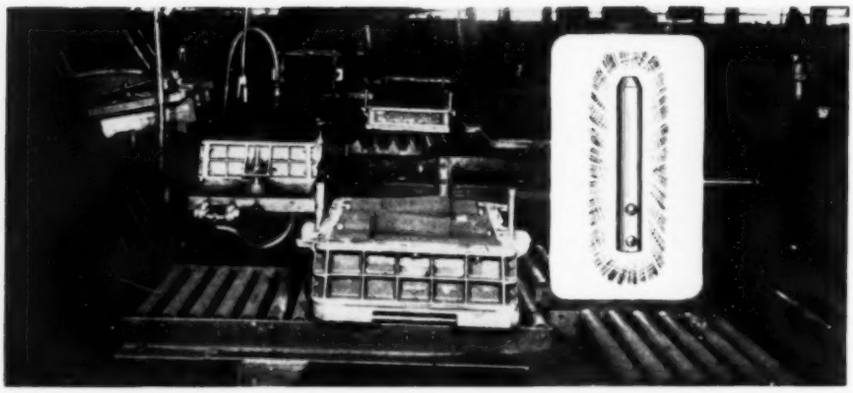
It follows, therefore, that a knowledge of slag composition and control is necessary to good practice. The slag, to all intents and purposes, becomes the tool of the metallurgist, with which he controls the amount and intensity of the steelmaking reactions, and thus the ultimate composition and condition of the steel.

Steel for castings must be so made as to solidify in sand molds without the evolution of dissolved gases. In the case of steel ingots, cast in a heavy chill mold and intended to be subjected later to mechanical work such as rolling or forging, gas possibly evolved during solidification, and producing blowholes, has at least a chance of being so reduced and compressed that the ultimate article is acceptable for many purposes. In the steel casting such defects are present permanently in the finished article to the degree in which they form during solidification. This fact has led to the constant study of melting reactions to eliminate gas-evolving tendencies as far as possible in the process of solidification. Completion of reactions in the melting furnace itself, and control of slag activity have become matters of prime importance if sound steel castings are to result.

It was inevitable that oxygen, at one time Public Enemy No. 1 in the minds of metallurgists and steelmakers, should come in for a fair share of attention as being of necessity an active participant in steelmaking processes. From this there developed an intensive interest in special deoxidizers, so that almost the final traces of this believed deleterious material could be removed.

Perfect deoxidation was stressed as

Simply Describe Your Baking Needs—We'll Show You A
LANLY
CORE OVEN
that is handling similar production with speed and modern high efficiency,
or, if your problem is unusual we will design an oven specifically to meet your requirements and *strongly guarantee its performance.*
This is made possible by a consistent record of success in producing ovens of different types for varying kinds of service—all of which are performing efficiently under exacting demands.
Write for the Lanly Catalog and get a proposal on your next oven.
LIFT DOOR OVENS
•
MOULD OVENS
•
CAR OVENS
•
PORTABLE RACK OVENS
•
CONVEYOR OVENS
THE LANLY CO.
750 PROSPECT AVE. • CLEVELAND, OHIO



FOR *Permanent* ALIGNMENT

Only Fremont Flasks give you the advantages of Groovlock construction. The pin, with its greater bearing surface, stays rigid permanently and makes for accuracy of draw. The corners are bolted, welded and guaranteed to remain solid. Ribbed walls outside and accurate machining inside further promote accuracy and long life. Heavy duty and medium weight models. Ask for Bulletin "F".

Fremont Jackets have bolted corners machined and drilled to precision with a jig. Castings can be furnished to replace broken ends or sides. Fremont Jackets are guaranteed to fit perfectly molds made in any standard flask.

Prompt shipments on all orders with priority ratings of A-1-K or better.

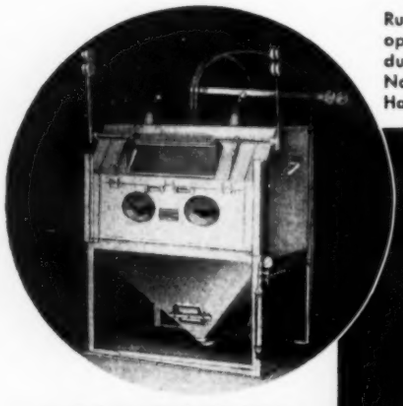
THE FREMONT FLASK COMPANY, FREMONT, OHIO

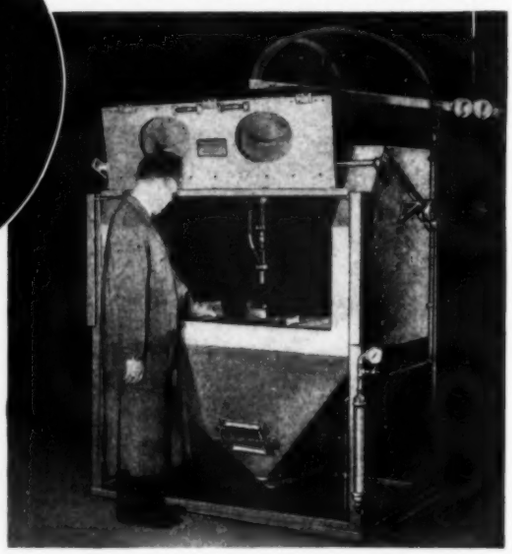
Slip Flasks FREMONT GROOVLOCK *Jackets*

SAND BLASTING *Made Easy*

for Defense Production!

Ruemelin Sand Blast Cabinets put blast cleaning operations on a faster, more efficient basis. Eliminate dust, permitting installation anywhere in the plant. No skilled labor required. Sturdily constructed. Handles sand or steel abrasives. Prompt delivery.





RECOMMENDED FOR:

1. Heat treating plant—removing scale, oxides.
2. Aircraft production—cleaning welds, metal preparation.
3. Foundries, ferrous and nonferrous — cleaning castings.

RUEMELIN MANUFACTURING CO.
3960 N. Palmer St • Milwaukee, Wis.

Ruemelin cabinet with door open. Provides quick access for loading and unloading.

RUEMELIN Blast Cleaning Cabinets

A 3635-½

an absolute essential in steel for sand castings, but the painstaking work of many foundry metallurgists has demonstrated that the remedy could be, in effect, often somewhat worse than the disease it was prescribed to cure. Methods of using deoxidizing materials to obtain their advantages free from coincident ill effects were given very much attention.

From the viewpoint of freedom from unsoundness, caused by evolved gases, there is no doubt present-day castings are far superior to their prototypes of a few years ago, and are subjected, also to considerably more severe physical acceptance tests.

Associated with the actual steel production side of steel castings manufacture, introduction of alloy steels probably has offered to the metallurgist the most fertile fields for development activities. In my opinion, he can claim, rightly, that the rapid engineering progress of the last few decades to a large extent has been due to his success in meeting demands made for special materials, of an individualized type.

Develop Alloy Steels

Expanding engineering demands quickly outmoded ordinary carbon steels for many purposes, and absorbed the whole of their potential service capacity. Introduction of alloys and alloy combinations allied to scientifically accurate heat treatment, planned to develop the full added benefit of the alloy additions, provided a solution to the many problems which arose from this cause.

It is not an exaggeration to say that failing the successful work of the metallurgist, the provision of suitable materials would have lagged badly behind engineering practice and development with disastrous results upon the progress of the latter. Today almost every known alloy combination commonly found in the general steel industry can be obtained in casting form, so constituted as to meet any specific engineering requirement. The field of alloy compositions is not by any means completely exhausted, and it is well within the bounds of possibility that the future will see many new types of such material, probably offering special possibilities of being utilized by the manufacturers of steel castings.

Fifteen or 20 years ago, with the exception of a few hardy pioneers in the steel founding industry, it was possible to cover the application of heat treatment of castings by the comprehensive terms "annealing" or "normalizing." Removal of internal strains, set up during cooling after solidification, by heating to a suitable temperature and allowing to cool slowly was given a position of

IMMEDIATE SHIPMENT on

Sand

Shipped promptly from selected pits located in Illinois, Tennessee, Ohio, Indiana and New York.

Sand

ST. LOUIS — 2 ARMIN PL. REPUBLIC 5097
EDWARDSVILLE—PHONE 134
MOLINE—TOM HAMLIN, JR.—Y. M. C. A.

MIDWEST FOUNDRY SUPPLY COMPANY
EDWARDSVILLE, ILL.

Quality---Service

prime importance. There is probably no section of steel castings production which has undergone so marked a change and development as heat treatment, as a direct result of the application of metallurgical science.

Significance of the phenomenon of recalescence and the recognition by metallurgists of the profound structural changes produced in steels at temperatures far below solidification, followed by the introduction into manufacturing practice of the fundamental knowledge, constitute definite milestones in the progress of the steel trade.

The practice of microscopy and development of interpretative methods to place under direct control the structure-forming operation of heat treatment have worked modern miracles in the provision of steels of specific performance characteristics.

The laboratory no longer is merely the place from which one obtains, after what used to be a tedious wait, the chemical composition of one's steel product. Chemical composition, while far from being unimportant, is realized, now, to be only one factor, and not by any means the most prominent one, in the preparation of steel articles for their intended service.

Control Thermal Treatment

In the steel foundry of today, exactly as in other branches of the steel industry, by the application of modern scientific thought the metallurgist controls the thermal treatment of cast shapes and produces in them crystalline structural formations best suited to insure satisfactory service. It is in association with correct heat treatment that the use of alloys previously referred to attains its chief significance.

I would venture to say that the use of alloys in steel castings would have expanded at a much faster rate, had it not been that many steel founders not employing metallurgists labored under the delusion that the analytical presence of a certain amount of an alloy was in itself a justification for its use, and that in such circumstances the desired effect on performance followed necessarily.

It is well known, of course, that this is far from being the case. It is realized that in most cases alloy content represents a means of intensifying the effect of heat treatment, so producing stronger and tougher steel articles. Without such orderly heat treatment the alloy content may quite probably be deleterious, and most certainly never fully advantageous.

Modern heat treatment of steel castings utilizes every method and type of operation used by the general steel trade; annealing, normalizing, quenching in water or oil, followed by adequate drawing treatments are everyday re-

STROMAN FURNACES

The New "Push-Back" Cover Has Caught on in a Big Way

So Simple So Easy

Cover ☞ Closed

and Open ☜

Oil or Gas Fired

Removable Operating Bar

And Pouring Types, too:

Plain Tilting and Stationary Lip.
Hand Operated and Motorized.
Gas or Oil Fired.

Hand Tilter

All Sizes to:
3000 Lbs. Aluminum
2000 Lbs. Magnesium
1200 Lbs. Brass

Write for Descriptive Bulletins

STROMAN Furnace & Eng'g. Co.
FRANKLIN PARK, ILL.

WPB
says

"Save metal"

ECONOMY in metal waste is essential now—becomes more vital each day! You can *save* by producing drosses and skimmings practically metal-free, through

"FOSECO"
MELTING PRACTICE

ALLOY		FOSECO
ALUMINUM	USE	COVERAL
BRASS	USE	CUPRIT
GUNMETAL BRONZES COPPER	USE	CUPRIT OR CUPREX
NICKEL ALLOYS	USE	CUPREX
ALUM. BZE MANG. BZE SILICON BZE	USE	ALBRAL
GRAY IRON	USE	IRON REGENERATOR

In addition to metal savings that alone pay for their use, FOSECO products make *improved* castings!

WRITE for full details, generous samples; or order 125-lb. drum on this GUARANTEE: *if not fully satisfied, cancel the invoice!*

FOUNDRY SERVICES
INC.
280 Madison Ave.
New York, N. Y.

quirements. Naturally, composition and heat treatment are mutually related in the mind of the experienced foundry metallurgist. Casting design frequently exerts a controlling and decisive influence on the heat treatment methods it is practicable to use. By playing composition, particularly from the alloy viewpoint, against the practically possible heat treatment, physical properties of a remarkable order and variety are now obtainable in steel castings of almost any common-sense design.

Influence of mass upon heat treatment response is also of critical importance, and to insure performance satisfaction must be correlated to composition and type of treatment. I need scarcely stress the point that such work is essentially metallurgical and calls for a full understanding insofar as modern fundamental knowledge permits of the structural effects of associated mass, composition, and heat treatment.

Study Production Troubles

I commented earlier on the enlargement of the metallurgist's scope to cover many of the factors in casting production, other than those directly attributable to the metal and its heat treatment.

The study of production troubles, resulting in casting defects, quite naturally soon became a portion of his work. It was apparent that a definite relationship existed between the behavior of metal solidifying in molds and the characteristics of the materials from which the molds were formed. Consequently, study of sands and binding materials and their behavior at molten metal temperatures developed into an important part of the foundry metallurgist's work.

Very largely out of his activities has grown the modern idea of sand control. As the practice developed, instruments have been devised for certain definite control testing of sands, and a serious attempt has been made to standardize a section of foundry technique, liable earlier to considerable variation.

Present investigation of the high temperature behavior of sands is likely to add appreciably to the necessary knowledge for their correct control, with promise of real improvement in casting quality.

The somewhat abridged outline I have endeavored to give of the foundry metallurgist's interests and activities probably will convey one very correctly based impression; that is, that by the substitution of cold scientific reason for rule of thumb methods, and a widely variable opinion, foundries are developing sound and definite ideas upon control. Elimination of variables, difficult to control by rule of thumb methods, must ultimately tend toward regularity of the product.

In any form of productive activity, if we can acquaint ourselves fully of the fundamental causes of observed phenomena, it is not a big step to the forming of counter measures for the prevention of deleterious effects.

Our difficulties in foundry practice have been due very largely to the undeniable existence of a mass of widely diverse opinion. This still is true, although in much less degree than was formerly the case. The very antiquity of the art of founding metallic objects would make it reasonable to expect that over the years dogma of one kind or another should so secure its position that scientific facts have a hard job to replace it. Fundamental knowledge was lacking which is now slowly and laboriously being supplied. Many of the previously accepted articles of the foundry creed have tottered and fallen in the last few decades, and men are growing up in the trade of a type which will accept the newer scientific thought and reasoning, and use them in practice, and who are of the modern independent thinking type, refusing dogma in the absence of cold proof.

Solve Foundry Problems

The combined chemist and metallurgist, with test tubes and microscopes, methods of testing and inspection, augmented to a growing extent by X-ray and related scientific tools of investigation, will possess the knowledge and ability to solve many of our more prominent foundry problems, given executive foundry co-operation. In the past he has been subjected to a scarcely veiled hostility in many cases, but can claim to have performed a valuable service in spite of it. What, then, would be the result given a spirit of complete co-operation?

Foundry success in the future will depend on a three-way co-operation. The designing engineer, the operating producer and the metallurgist, by getting together in the proper spirit, can and will remove a large part of the difficulties of control and insure regularity. An open-minded attitude on the part of all three permitting formed opinions to be modified by hard, demonstrated facts, will speed up materially the desired results. However, it is reasonably safe to make the statement that the result will arrive in time in spite of opposition, as a logical outcome of economic law and natural progress, which have an unpleasant habit of eliminating obstacles to forward development.

The steel foundry metallur ist still has before him vast fields, offering opportunity of product improvement. There are still many factors not thoroughly under control, principally because they are not yet completely under-

stood. With the many new tools and instruments at his disposal, the possibilities of elucidation constantly grow, and progress tends to become faster.

This truly metallurgical war in which we are now actively engaged has opened up many new forms of application, and steel castings have an important role to fill. They have demonstrated their adaptability to many forms of war requirements, and the industry might well adopt some slogan such as, "Still more and still better."

In this betterment the foundry metallurgist must play a great part. I look with confidence to material forward steps toward perfection in steel castings, a goal difficult to achieve, admittedly, but one which can be reached, given fundamental knowledge, and designing and production co-operation.

This article is from a paper presented by the author at the Kegional Foundry Conference held early this year at Milwaukee under the joint sponsorship of the Wisconsin Chapter of the A.F.A. and the University of Wisconsin.

THE EDITORS

Maintenance Check Chart Prepared

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has prepared a maintenance check chart for electrical apparatus in industrial and central station use. Points to check, as covered by the chart, are as follows:

Motors: Keep windings, ventilating ducts, commutators and brush rigging clean. Lubricate re ularly and carefully. Examine bearings. Check air gap between rotor and the stator. Inspect brushes and commutators. Inspect all exposed motor leads and ground connections.

Control equipment: This includes magnetic switches, air and oil circuit breakers, controllers, compensators, etc. Keep such equipment clean and contacts smooth. Rep'ace worn parts. Keep electrical and mechanical connections tight, and oil at proper level and in good condition. Check overload devices.

Wiring: Keep wiring in safe condition. Check extensions and drop cords. Keep switch, junction, fuse and panel boxes clean and tightly covered.

Fuses: Check s'ze; keep fuse clips clean and tight; maintain refillable type fuses and keep fuse and switch cabinets tight.

Transformers: Keep oil in good condi'ion and maintained at proper level. Prevent excessive temperatures.

Scully-Jones & Co., Foundry Division, recently moved its warehouse and office from 1901 South Rockwell street, Chicago, to 2031 West Seventy-fourth street, Chicago.

WHEN FOUNDRY TEMPERATURES RISE—
KEEP WORKERS SUPPLIED WITH THESE AIDS

★
"EYE-KLEAR" SWEATBANDS
To keep perspiration out of eyes, goggles.

★
ANTI-MIST FOR GOGGLES
Rub on lenses to prevent fogging due to heat.

★
SALT TABLETS-DISPENSERS
Prevent heat sickness and fatigue.

INEXPENSIVE
INDISPENSABLE

"Eye-Klear" Sweatbands save "brow-mopping" time. Made of new, soft, highly absorbent material. Need no pre-wetting. Snap back into shape after squeezing.

PULMOSAN SAFETY EQUIPMENT CORP.
176 JOHNSON STREET BROOKLYN, NEW YORK

TAMMS No. 100 "LIQUID" CLEANER

Cleans all core equipment faster! No need to waste valuable time scouring and scraping metal core boxes, drier plates, blow plates, core vents, etc. — just "SOAK 'EM CLEAN" with TAMMS No. 100 "Liquid" Cleaner. It's fast acting—thorough—won't harm metal! Write for money saving details!

TAMMS No. 90 IRON OXIDE

For use in grey iron and steel foundries. Add it to your regular core sand mix to prevent core burning, veining and penetration. Prevents core sand failure, improves castings, reduces cleaning costs. A proven success in war production Foundries. Inexpensive — write for SAMPLE!

ALL TAMMS PRODUCTS MEAN SAVINGS FOR YOU!

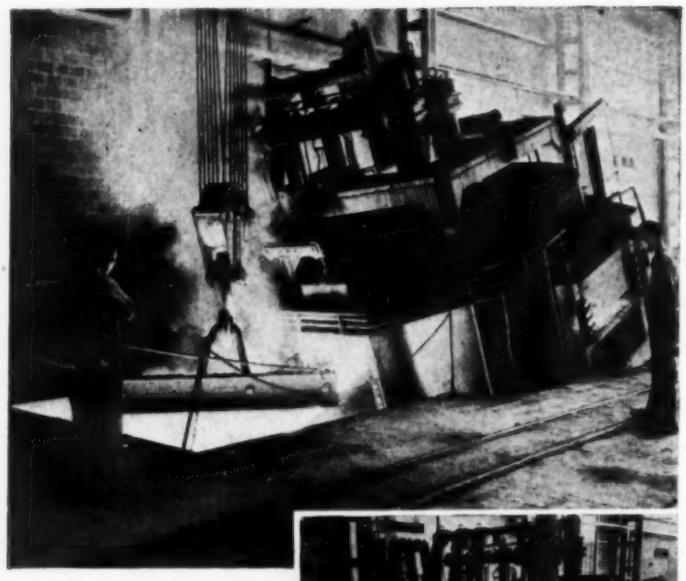
TAMASTONE
Pattern compound converts bench or floor molding into low cost cope and drag jolt-roll-over jobs. "Production up 400%, costs down 75%", users say!

LIQUID PARTING
Just spray on pattern and dry with air hose. Stops sand sticking, gives exact detail, won't build-up. Many run all day without recoating. *Not dusty!*

Pyramid SKIMMERS
Scientifically designed to skim brass or bronze alloys. Guards against casting rejection. High heat resistant. Keeps metal analysis constant. 3 styles for every specific problem.

You get prompt delivery on all TAMMS products

TAMMS SILICA COMPANY—228 N. LaSalle St., Chicago, Illinois



Floor-mounted, cylindrical shell, Type 20 Heroult Furnace for the production of stainless steel. An all-welded unit designed for charging with an open-hearth charging machine, equipped with rocker type tilting mechanism, and embodying all latest improvements.

Heroult
ELECTRIC FURNACES

AMERICAN BRIDGE Heroult Electric Furnaces now embody novel and distinctive features—the result of constant striving to perfect the most modern and economical tool for efficient melting and refining of iron and steel for castings, high grade alloy, tool and stainless steels.

Dependent on size and operating requirements, they are adaptable to hand, chute, machine or drop-bottom bucket charging. Capacity ratings range from ½ to 100 tons.

Why not avail yourself of the technical knowledge and wide practical experience of our furnace specialists for your specific requirements.

AMERICAN BRIDGE COMPANY

General Offices: Frick Building, Pittsburgh, Pa.

Baltimore · Boston · Chicago · Cincinnati · Cleveland · Denver
Detroit · Duluth · Minneapolis · New York · Philadelphia · St. Louis
Columbia Steel Company, San Francisco, *Pacific Coast Distributors*
United States Steel Export Company, New York

USS

UNITED STATES STEEL

FREE & RAPID VENTING

Buffalo Brand Vent Wax is a small item when you consider the equipment that is required to run a modern foundry. Yet many a casting has been shaken out and consigned to the scrap pile because of the lack of so small an item as vent wax. Buffalo Brand Vent Wax is really production insurance; at a cost of a few pennies per casting, it reduces "blowing" losses to an absolute minimum. Its dependability is a byword among foundrymen everywhere. Because they know from experience that its use insures free and rapid venting, they never specify "vent wax"; they insist on BUFFALO BRAND vent wax. If you are among the few who haven't tried it yet, a free sample will be sent on request.

VOTE FOR

BUFFALO BRAND VENT WAX

UNITED COMPOUND COMPANY, BUFFALO, N.Y.

◆ ◆ WHERE-TO-BUY ◆ ◆

The following classified list of advertisers according to products is conducted for the convenience of our readers in quickly locating sources of all types of foundry equipment and supplies. If you are seeking information on any product not listed in this directory, a letter or post card addressed to THE FOUNDRY, Penton Building, Cleveland, will bring you this information by return mail.

ABRASIVE (Bricks and Files)
Abrasive Co., Div. of Simonds Saw & Steel Co., Tacony & Fraley Sts., Philadelphia, Pa.
Bay State Abrasive Products Co., Westboro, Mass.
Carborundum Co., Niagara Falls, N. Y.
Macklin Co., Jackson, Mich.
Norton Co., Worcester, Mass.
Safety Grinding Wheel & Mach. Co., Springfield, O.
Simonds Worden White Co., Dayton, O.
Sterling Grinding Wheel Co., Tiffin, O.

ABRASIVE CLOTH and PAPER
Behr-Manning Div. of Norton Co., Worcester, Mass.
Carborundum Co., Niagara Falls, N. Y.

ABRASIVE (Metallic)—See SHOT and GRIT

ABRASIVE (Mineral)—See SANDS, Blasting

ABRASIVE WHEELS
Abrasive Co., Div. of Simonds Saw & Steel Co., Tacony & Fraley Sts., Philadelphia, Pa.
Bay State Abrasive Products Co., Westboro, Mass.
Carborundum Co., Niagara Falls, N. Y.
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Macklin Company, Jackson, Mich.
Manhattan Rubber Mfg. Div. of Raybestos, Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Norton Company, Worcester, Mass.
Safety Grinding Wheel & Mach. Co., Springfield, O.
Simonds Worden White Co., Dayton, O.
Sterling Grinding Wheel Co., Tiffin, O.
West Co. Inc., 1117 Shackamaxon St., Philadelphia, Pa.

ABRASIVE CUTOFF MACHINES
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
Tannewitz Works, Grand Rapids, Mich.

ACETYLENE GENERATORS
Sight Feed Generator Co., Richmond, Ind.

AIR COMPRESSORS
Campbell-Hausfeld Co., Harrison, O.
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Fuller Company, Catasaqua, Pa.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Schramm Inc., 800 N. Garfield Ave., West Chester, Pa.

AIR CONDITIONING EQUIPMENT
American Air Filter Co., Inc., 266 Central Ave., Louisville, Ky.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Parsons Engineering Corp., Cleveland, O.

AIR CONTROL EQUIPMENT
Air-Way Pump & Equipment Co., 405 S. Jefferson St., Chicago, Ill.
American Air Filter Co., 266 Central Ave., Louisville, Ky.
Jas. A. Murphy & Co., Hamilton, Ohio.
Foxboro Co., Foxboro, Mass.

AIRLESS BLAST CLEANING EQUIPMENT
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

AIR SEPARATORS—See SEPARATORS, AIR MOISTURE, OIL

ALKALI—See DESULPHURIZERS

ALLOYS
American Brass Co., 25 Broadway, New York, N. Y.
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Globe Iron Co., Jackson, Ohio.
International Nickel Co. Inc., 67 Wall St., New York City.
Niagara Falls Smelting & Refining Corp., 2204 Elmwood Ave., Buffalo, N. Y.
Molybdenum Corporation of America, Pittsburgh, Pa.
Ohio Ferro-Alloys Corp., Canton, O.

ALLOYS (Ferro)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Hickman-Williams & Co., Union Trust Bldg., Cleveland, O.

ANNEALING FURNACES (Electric)
General Electric Co., Schenectady, N. Y.

AREATORS
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.

ARRESTORS (Dust)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

ASSOCIATIONS
Crucible Manufacturers Association, 90 West street, New York, N. Y.

BANDS (Snap Flask)
Adams Co., 800 Foster St., Dubuque, Ia.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

BAND SAWS (High Speed)
Tannewitz Works, Grand Rapids, Mich.

BAND SAWS (Variable Speed)
Tannewitz Works, Grand Rapids, Mich.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Republic Steel Corp., Cleveland, O.

BEARINGS (Anti-friction, Roller and Ball)
Link Belt Co., 519 N. Holmes Ave., Indianapolis, Ind.

BELTING (Conveyor, Elevator)
Imperial Belting Co., 1800 So. Kilbourn Ave., Chicago, Ill.

BELTS (Power Transmission)
Imperial Belting Co., 1800 So. Kilbourn Ave., Chicago, Ill.

BENTONITE
American Colloid Co., 363 W. Superior St., Chicago, Ill.
Eastern Clay Products, Inc., Eifort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia, Pa.
F. E. Schundler & Co. Inc., 520 Railroad Ave., Joliet, Ill.

BINS (Storage)
American Bridge Co., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

BLACKING (Mold, Core)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
J. S. McCormick Co., 25th St. & A. V. R. R., Pittsburgh, Pa.
United States Graphite Co., Saginaw, Mich.

BLASTING EQUIPMENT
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Steel Abrasives Co., Galion, O.

BLASTING EQUIPMENT (Cont'd.)
Dreisbach Engineering Corp., 45 Warburton Ave., Yonkers, N. Y.
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

BLAST METERS
Foxboro Co., Foxboro, Mass.

BLOW PIPING
Cleveland Blow Pipe & Mfg. Co., 6505 Cedar Ave., Cleveland, Ohio.

BLOWERS
American Air Filter Co., 266 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
General Blower Co., 406 N. Peoria St., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Mahr Manufacturing Co., Div. Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.
Stroman Furnace & Engineering Co., Franklin Park, Ill.

BOLTS AND NUTS
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Republic Steel Corp., Cleveland, O.

BOND (Clay)
American Colloid Co., 363 W. Superior St., Chicago, Ill.
Eastern Clay Products Inc., Eifort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Lawrence Clay Co., Jackson, O.
F. E. Schundler & Co. Inc., 520 Railroad Ave., Joliet, Ill.

BOOKS (Technical)
Penton Publishing Co., 1213 West 3rd St., Cleveland, O.

BOTTOM PLATES and BOARDS
Moltrup Steel Products Co., Beaver Falls, Pa.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

BOWLS and SHANKS
Industrial Equipment Co., Minster, O.

BOXES (Tote)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

BRAKES (Magnetic)
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

BRICK (Refractory)
Carborundum Co., Niagara Falls, N. Y.
Haws Refractories Co., Johnstown, Pa.
Norton Co., Worcester, Mass.
Ramtite Company, Div. of S. Obermayer Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, O.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

BRIQUETS (Alloy)
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

BRIQUETS (Ferro Alloy)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

BRIQUETS (Silicon Carbide)
Carborundum Co., Niagara Falls, N. Y.

BRIQUETTING MACHINERY (Metal)
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.

BRUSHES
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

BUCKETS (Elevating, Clam Shell, Drag Line, Grab, Loader, Dumping)
Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

BUILDING and ENGINEERING SERVICE
American Bridge Co., Pittsburgh, Pa.

BURNERS (Acetylene, Oil, Gas, Powdered Coal, Stoker)
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.
Stroman Furnace & Engineering Co., Franklin Park, Ill.

BUSHINGS (Flask Pin)
C. M. Smillie & Co., 1100 Woodward Hgts. Blvd., Ferndale, Mich.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

CALCIUM MOLYBDATE
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Molybdenum Corporation of America, Pittsburgh, Pa.

CALCIUM BORIDE
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Molybdenum Corporation of America, Pittsburgh, Pa.

CASSETTES (X-Ray Film)
Picker X-Ray Corp., 300 Fourth Ave., New York City

CASTINGS
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O.

CASTING PLASTER
National Gypsum Co., Buffalo, N. Y.

CEMENT (Metallic)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
Smooth-On Manufacturing Co., 570 Communipaw Ave., Jersey City, N. J.

CEMENT (Refractory)
Bay State Abrasive Products Co., Westboro, Mass.
Carborundum Co., Niagara Falls, N. Y.
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Norton Co., Worcester, Mass.
Ramtite Company, Div. of S. Obermayer Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, O.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

CHAIN (Hoist, Conveyor, Drive, Sling, etc.)
American Chain Division of American Chain & Cable Co., Inc., Bridgeport, Conn.
Chain Belt Co., Milwaukee, Wis.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.

—When writing advertisers, please mention THE FOUNDRY—

"KEEP 'EM MOVING!"

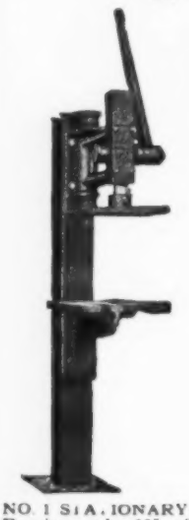
with

MOLINE SQUEEZERS

285

12" x 16" MOLDS DAILY

NO. 4 HEAVY-DUTY PORTABLE



NO. 1 STATIONARY
Requires only 25" of floor space and will handle flasks 12 x 24" or under. Table is 12" x 16"; pressure plate 8" x 12".

More than 285 molds a day are being made on Moline Squeezers with 12" x 16" flasks in regular production! No. 4 machine, shown above, will handle flasks 16" x 30" or under. Width inside to inside of wheels, 65". Height of table above floor, 30". Table dimensions, 21" x 16". Pressure Plate, 8" x 15" (or furnished 12" x 14"). No extra charge for set-off benches.

4 MODELS TO CHOOSE FROM

Write for Prices and Complete Folders

QUICK DELIVERY

LOW PRICES

Moline Iron Works

MOLINE, ILL., U.S.A.

WHERE-TO-BUY

CHAPLETS
Cleveland Chaplet & Mfg. Co., W. 67th St. and N.Y.C. Ry., Cleveland, O.
Combined Supply & Equipment Co., Inc., 215 Chandler St., Buffalo, N. Y.
Fanner Mfg. Co., Brookside Park, Cleveland, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Milwaukee Chaplet & Mfg. Co., 1023 So. 40th St., Milwaukee, Wis.
One Piece Chaplet Co., 4001 Ashland, Philadelphia, Pa.
Frederic B. Stevens, Inc., Detroit, Mich.

CHARGING EQUIPMENT
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CHEMICALS
Hercules Powder Co., 999 Market St., Wilmington, Del.
The Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.

CHEMISTS
Chas. C. Kawin Co., 431 So. Dearborn St., Chicago, Ill.

CHILLS
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
Chicago Chaplet Co., 2047 N. Wood St., Chicago, Ill.
Fanner Mfg. Co., Brookside Park, Cleveland, O.
Milwaukee Chaplet & Mfg. Co., 1023 So. 40th St., Milwaukee, Wis.

CHILL COATINGS
Dayton Oil Co., Dayton, O.

CHILL OILS
Certified Core Oil & Mfg. Co., 3308 So. Cicero Ave., Chicago, Ill.

CHIPPERS—See PNEUMATIC TOOLS
Fanner Mfg. Co., Brookside Park, Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.

CHROMIUM (Briquets)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

CLAMPS (Flask)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

CLAY (Bonding)
American Colloid Co., 363 W. Superior St., Chicago, Ill.
Eastern Clay Products, Inc., Elfort, O.
The Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Illinois Clay Products Co., Joliet, Ill.
The Lawrence Clay Co., Jackson, O.
F. E. Schundler & Co. Inc., 520 Railroad Ave., Joliet, Ill.

CLAY (Refractory)—See FIRE CLAY

CLEANING COMPOUNDS (Window, etc.)
Hercules Powder Co., 999 Market St., Wilmington, Del.

CLOTHING (Safety)—See SAFETY CLOTHING

CLUTCHES (Magnetic)
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.

COAL (Foundry)
Republic Coal & Coke Co., 8 So. Michigan Ave., Chicago, Ill.

COKE (Foundry)
Hickman-Williams & Co., Cleveland, O.
Pickands, Mather & Co., Cleveland, O.
Republic Coal & Coke Co., 8 So. Michigan Ave., Chicago, Ill.

COLLECTORS (Dust)
American Air Filter Co., 266 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.

COLLECTORS (Dust) (Cont'd.)
Buell Engineering Co., 14 Cedar St., New York City.
Industrial Sheet Metal Wks., 325 E. Forest Ave., Detroit, Mich.
Pangborn Corp., Hagerstown, Md.
R. C. Mahon Co., 8650 Mt. Elliott Ave., Detroit, Mich.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

COMBUSTION EQUIPMENT
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

COMPRESSORS—See AIR COMPRESSORS

CONTAINERS (Shipping)
Seymour & Peck Co., P. O. Box 5609, Chicago, Ill.

CONTROL SYSTEMS (Dust)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Air Filter Co., 223 Central Ave., Louisville, Ky.
Buell Engineering Co., 14 Cedar St., New York City.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

CONVERTERS (Bessemer)
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

CONVERTER BLOWERS
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.

CONVEYORS (Belt)
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Imperial Belting Co., 1800 So. Kilbourn Ave., Chicago, Ill.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mahr Mfg. Co., Div. Diamond Iron Wks. Inc., Dept. F8, Minneapolis, Minn.
The Manhattan Rubber Mfg. Div. of Raybestos, Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.
Robins Conveying Belt Co., Passaic, N. J.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Chain)
Chain Belt Co., Milwaukee, Wis.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Gravity)
Chain Belt Co., Milwaukee, Wis.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Live Roller)
Chain Belt Co., Milwaukee, Wis.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Magnetic)
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

CONVEYORS (Monorail)
American Monorail Co., 13104 Athens Ave., Cleveland, O.
Chain Belt Co., Milwaukee, Wis.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Mathews Conveyer Co., 104 Tenth St., Ellwood City, Pa.

CONVEYORS (Pneumatic)
Fuller Company, Catasaqua, Pa.

CONVEYORS (Rubber)
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Standard Conveyor Co., North St. Paul, Minn.

CONVEYORS (Vibrating)
Syntron Company, Homer City, Pa.

COPPER SHOT
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
Niagara Falls Smelting & Refining Corp., 2204 Elmwood Ave., Buffalo, N. Y.

—When writing advertisers, please mention THE FOUNDRY—

H·C·CHILLED
GLOBE
SHOT

Helping to finish the armament to finish the war

"More and more production!" is the cry that echoes up and down the seas and continents; it comes from the capitals of free countries and their armed camps; it rings throughout America like a call to victory. In the cleaning rooms of today's foundries, rigid specifications would hamper production were it not for Globe "H-C" Chilled Shot and Globe Cornered Steel Grit. These steel abrasives perform their chores tirelessly and efficiently. Through their use, the most exacting cleaning becomes routine, production is uninterrupted and vital war equipment gets polished to polish off the Axis.

THE GLOBE STEEL ABRASIVE CO.
MANSFIELD, OHIO

Buckeye Silica Firestone

Sawed or Split

—a natural rock for LINING—

Soaking Pits . . . Blast Furnace Ladles
Bessemer Converters . . . Mixers
Grey Iron Cupolas
Foundry Crane Ladles
Air Furnaces . . . Drop Forge Bottoms
Acid Pickling Tanks

LASTS LONGER COSTS LESS

Write for Literature

The Cleveland Quarries Co.
1125 Builders Exchange Building
Cleveland, Ohio

OLIVER
TOOL-SAVING
OILSTONE GRINDERS

FIVE PRINCIPAL USES:

Curved tool grinding; Sloyd knife stroping; Cold chisel grinding (on general utility wheel); Jack-plane bit grinding (angle corrected by tool holder); Skew chisel grinding.

These Variety Oilstone Tool Grinders will handle every tool grinding operation in your pattern shop. They are compact, portable, and will operate from a light socket. Sharp tools mean increased efficiency—and these grinders really keep 'em sharp. We mentioned only five operations. you will undoubtedly discover dozens of others. Illustrated circulars will give full details.

OLIVER MACHINERY CO.
GRAND RAPIDS, MICH.

KEEP IT DRY

THE MURPHY AIR RECEIVER DRAIN TRAP

• This Air Receiver Drain Trap has now eliminated the necessity of draining the accumulated water from the receiver tank by hand. In some plants this draining is scheduled for each morning, others perform this operation once a week, while in some plants it is only done on a hunch.

This is not and cannot be a satisfactory method, as at all times, except for a few moments after draining, there is water in the tank again. Then too, in draining, many the cubic foot of good air at high pressure—the most costly power—is wasted.

As the receiver tank performs the duties of accumulator, balancer, cooler, and dryer, the latter very necessary function is largely destroyed when water in any quantity is allowed to accumulate in the bottom, for the air re-absorbs the water again, the amount depending on pressure and temperature.

The Murphy Receiver Trap is designed to keep the receiver free from water all the time so that there is none to be reabsorbed. As fast as condensation takes place the water—and the oil too—descend to the trap where it is automatically ejected.

No air plant is complete without this most indispensable attachment. There is no grief connected with it.

Made in one size only for ½-inch pipe connection.

PRICE, $17.00

F. O. B. Hamilton, Ohio

AUTOMATIC SEPARATORS
AFTERCOOLERS
MURPHY PISTOL SPRAYERS
HAMILTON SPRAY GUNS
EXTRUSION MACHINES

Literature on Request

JAMES A. MURPHY & CO.

HAMILTON, O.

WHERE-TO-BUY

CORE BINDERS
American Gum Products Co., 500 Fifth Ave., New York, N. Y.
Certified Core Oil & Mfg. Co., 3308 So. Cicero Ave., Chicago, Ill.
Corn Products Sales Co., 17 Battery Pl., New York City.
Dayton Oil Co., Dayton, Ohio.
Delta Oil Products Co., Milwaukee, Wis.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Hercules Powder Co., 999 Market St., Wilmington, Del.
International Paper Co., 220 E. 42nd St., New York City.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.
Penola Inc., Pittsburgh, Pa.
Robeson Process Co., 500 Fifth Ave., New York.
Werner G. Smith Co., (Div. of Archer-Daniels-Midland Co.), 2191 W. 110th St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.

CORE BLOWING MACHINES
Champion Foundry & Machine Co., 1314 West 21st St., Chicago, Ill.
Wm. Demmler & Bros., Kewanee, Ill.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

CORE BREAKERS
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.

CORE COMPOUND
Certified Core Oil & Mfg. Co., 3308 So. Cicero Ave., Chicago, Ill.
Dayton Oil Co., Dayton, Ohio.
Delta Oil Products Co., Milwaukee, Wis.
The Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
International Paper Co., 220 E. 42nd St., New York City.
The Werner G. Smith Co., (Div. of Archer-Daniels-Midland Co.), 2191 W. 110th St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.
Penola Inc., Pittsburgh, Pa.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
E. J. Woodison Co., 7515 St. Aubin Ave., Detroit, Mich.

CORE DRAWER
Freeman Supply Co., Toledo, O.

CORE GRINDERS (Power Operated)
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.

CORE KNOCKOUT MACHINES
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Simplicity Engineering Co., Durand, Mich.

CORE MAKING MACHINES
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa.
Wm. Demmler & Bros., Kewanee, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia, Pa.

CORE OIL
Certified Core Oil & Mfg. Co., 3308 So. Cicero Ave., Chicago, Ill.
Dayton Oil Co., Dayton, O.

CORE OIL (Cont'd.)
Delta Oil Products Co., Milwaukee, Wis.
Penola Inc., Pittsburgh, Pa.
Werner G. Smith Co., (Div. of Archer-Daniels-Midland Co.), 2191 W. 110th St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
E. J. Woodison Co., 7515 St. Aubin Ave., Detroit, Mich.

CORE OVENS
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Cleveland Blow Pipe & Mfg. Co., 6505 Cedar Ave., Cleveland, Ohio
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
Lanly Company, 750 Prospect Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Mahr Mfg. Co., Div. of Diamond Iron Works Inc., Dept. F8, Minneapolis, Minn.
R. C. Mahon Co., 8650 Mt. Elliott Ave., Detroit, Mich.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

CORE PASTE
Corn Products Sales Co., 17 Battery Pl., New York City
Dayton Oil Co., Dayton, O.
Delta Oil Products Co., Milwaukee, Wis.
Eastern Clay Products, Inc., Eifort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
J. S. McCormick Co., 25th St. & A. V. R. R., Pittsburgh, Pa.
Midwest Foundry Supply Co., Edwardsville, Ill.

CORE PLATES (Steel, Asbestos)
Diamond Clamp & Flask Co., Richmond, Ind.
Johns-Manville, 22 East 40th St., New York City
Sterling Wheelbarrow Co., 7100 W Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

CORE RODS
Bethlehem Steel Co., Bethlehem, Pa.

CORE ROD STRAIGHTENING and CUTTING MACHINERY
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Kane & Roach, Syracuse, N. Y.

CORE SAND
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Ottawa Silica Co., Ottawa, Ill.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

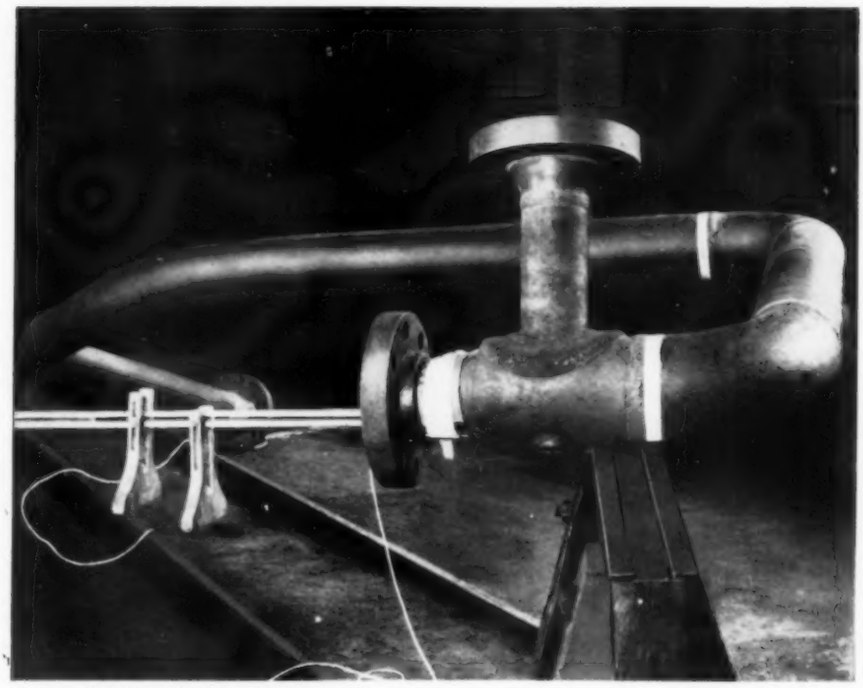
CORE SAND MIXERS
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

CORE VENTS
Champion Foundry and Machine Co., 1314 W. 21st St., Chicago, Ill.
Wm. Demmler & Bros., Kewanee, Ill.
C. M. Smillie & Co., 1100 Woodward Hgts. Blvd., Ferndale, Mich
United Compound Co., Inc., 328 South Park Ave., Buffalo, N. Y.

CORE WASH
Carborundum Co., Niagara Falls, N. Y.
Corn Products Sales Co., 17 Battery Pl., New York City.
Dayton Oil Co., Dayton, O.
Delta Oil Products Co., Milwaukee, Wis.

—When writing advertisers, please mention THE FOUNDRY—

RADIUM *for* INDUSTRIAL RADIOGRAPHY



Courtesy Pittsburgh Piping and Equipment Co.

The illustration shows radium being used to take a radium-radiograph of a weld. Placing the radium centrally in the pipe and the film on the outside permits of taking a radiograph of the entire circumferential weld with one exposure. This is just one of the many advantages of the use of radium for industrial radiography.

RADIUM MAY BE PURCHASED OR RENTED BY THE DAY, MONTH OR YEAR.

WRITE FOR DETAILS

Pioneers in the Use of Radium for Industrial Radiography

RADIUM CHEMICAL COMPANY, INC. · 570 Lexington Ave., N. Y. · Chicago: Marshall Field Annex Bldg.

MORE PATTERNS for Less Money

Pattern makers increase output with DELTA

LOW-COST MACHINES

Pattern makers are quick to catch on! They have found they can *do better work—in less time*—with Delta woodworking machines that cost one-third of their ponderous predecessors. As a result—today—thousands of pattern shops are using Delta saws, drill presses, jointers, shapers, lathes and grinders. In addition to low first cost, these new type machines offer: low maintenance and operating costs, many time-saving features, dependable accuracy, compactness, portability and unusual adaptability to special requirements.

For full details and prices, write today for latest Delta Catalog. The Delta Mfg. Company, 622-K E. Vienna Ave., Milwaukee, Wis.

Advantages of Delta Machines

1. LOW FIRST COST
2. LOW MAINTENANCE COST
3. ECONOMICAL OPERATION
4. REDUCED LABOR COST
5. GREATER FLEXIBILITY
6. PORTABILITY

DOUBLE YOUR PRODUCTION — with the fastest and most powerful Rammer made —

NO. 4 DAYTON RING VALVE BENCH RAMMER

Aside from its efficiency, the chief advantage of this Rammer lies in its long life. The Valve Unit will last for years without repair or replacement. The Cylinder Bore and Piston Rod are HARD CHROME PLATED, features which double the life of the Rammer and reduce maintenance costs at least one-half. Have been adopted as standard by some of the largest users of Rammers throughout the Country. MADE IN FIVE SIZES. Send for Bulletin No. 300.

DAYTON PNEUMATIC TOOL CO., DAYTON, O.

SIMPLICITY

FOUNDRY EQUIPMENT

Simplicity Foundry Equipment is doing its share to speed up production on the Defense Program. Simplicity Shake-Outs and Sand Screens are going out in ever increasing numbers into the foundries that produce the castings for aeroplanes, trucks, tanks and shells. Simplicity Equipment is also playing a part in the expansion program of the vital Machine Tool Industry, by helping to speed up production in the foundries supplying the castings for these tools.

We are proud of the record made by Simplicity Equipment in the Foundry Industry, and pledge our best efforts toward maintaining this record.

Simplicity

ENGINEERING COMPANY

DURAND, MICHIGAN

WHERE-TO-BUY

CORE WASH (Cont'd.)

Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Foundry Services Inc., 280 Madison Ave., New York, N. Y.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.
Penola Inc., Pittsburgh, Pa.
Pollard Oil Products Co., 1627 So. 44th St., Milwaukee, Wis.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United States Graphite Co., Saginaw, Mich.

CORE WIRE CUTTERS

Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

CORE WIRE STRAIGHTENERS

Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

COUPLINGS (Flexible)

Chain Belt Co., Milwaukee, Wis.

CRANES (Bucket)

Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANE LUBRICATING SYSTEMS

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa.

CRANES (Electric Traveling)

American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Cleveland Tramrail Div., of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Conco Engineering Works, Mendota, Ill.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.
Wright Manufacturing Division of American Chain & Cable Co., Inc., York, Pa.

CRANES (Gantry)

Modern Equipment Co., Dept. 194, Port Washington, Wis.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANES (Hand Traveling)

American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANES (Jib)

American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CRANES (Monorail)

American Engineering Co., 2418 Aramingo St., Philadelphia, Pa.
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Conco Engineering Works, Mendota, Ill.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Modern Equipment Co., Dept. 194, Port Washington, Wis.

CRUCIBLES

American Crucible Co., Shelton, Conn.
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Joseph Dixon Crucible Co., Jersey City, N. J.

CRUCIBLES (Cont'd.)

Lava Crucible Co., Pittsburgh, Pa.
Ross-Tacony Crucible Co., Tacony, Philadelphia, Pa.
Vesuvius Crucible Co., Swissvale, Pa.

CRUCIBLE FURNACES

Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., Dept. B. 1742 N. Kolmar Ave., Chicago, Ill.
Stroman Furnace & Engineering Co., Franklin Park, Ill.

CRUCIBLE LIFTERS

Modern Equipment Co., Dept. 194, Port Washington Wis.

CRUCIBLE POURING DEVICES

Modern Equipment Co., Dept. 194, Port Washington, Wis.

CRUSHERS & PULVERIZERS (Coal)

Jeffrey Mfg. Co., 907 N. Fourth St., Columbus, O.

CUPOLAS

Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CUPOLA BLOWERS

Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

CUPOLA CHARGING MACHINES

American Monorail Co., 13104 Athens Ave., Cleveland, O.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CUPOLA CONTROL EQUIPMENT

Edwin S. Carman, Lee Rd. at Mayfield, Cleveland, O.
Foxboro Co., Foxboro, Mass.

CUPOLA DUST ARRESTORS

Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

CUPOLA LIGHTERS

Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.

CUPOLA LININGS

Carborundum Co., Niagara Falls, N. Y.
Haws Refractories Co., Johnstown, Pa.
Ramtite Company, Div. of S. Obermayer Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, Ohio.
United States Graphite Co., Saginaw, Mich.

CUPOLA LUMP FERRO ALLOYS
See FERRO SILICON, FERRO CHROME, FERRO MANGANESE

CUTTING OILS

Penola Inc., Pittsburgh, Pa.

CUTOFF MACHINES (Abrasive)

Fox Grinders Inc., Oliver Bldg., Pittsburgh, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

CYLINDERS (Air, Hydraulic)

Galland-Henning Mfg. Co., 2750 So. 31st St., Milwaukee, Wis.

DARK ROOM ACCESSORIES (X-Ray)

Picker X-Ray Corp., 300 Fourth Ave., New York City.

DARK ROOM PROCESSING (Chemical Tanks, etc.)

Picker X-Ray Corp., 300 Fourth Ave., New York City.

DEGASIFIERS

Foundry Services Inc., 280 Madison Ave., New York, N. Y.

DESULPHURIZERS

Hercules Powder Co., 999 Market St., Wilmington, Del.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

—When writing advertisers, please mention THE FOUNDRY—

SILICA BRICK
FIRE BRICK
SLEEVES
NOZZLES
RUNNER BRICK
HOT TOPS
FIRE CLAY &
SILICA CEMENT

SINCE 1856

★ ★ ★ ★ ★

Pioneer Manufacturers of Refractory Products

HAWS REFRACTORIES COMPANY
JOHNSTOWN, PENNSYLVANIA

DETROIT, MICH.
General Motors Building. Phone: Trinity 1-1140

PITTSBURGH, PA.
Farmers Bank Building. Phone: Atlantic 1656

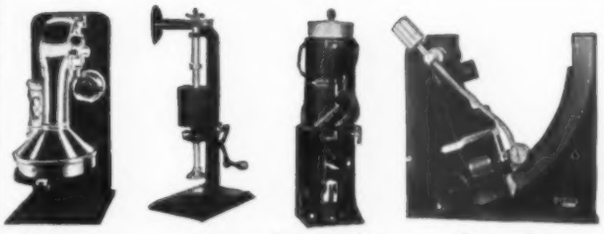
TIECO
FOUNDRY LADLES

TIECO geared ladles eliminate binding or sticking gear troubles. This patented feature assures accurate pouring and long life, due to the absence of drops and jerks and all trouble due to distortion or springage of the Bail or Bowl or both, caused by heat is removed. TIECO Ladles come in all types and sizes and are furnished for manual or electric operation.

Write for descriptive literature.

THE INDUSTRIAL EQUIPMENT COMPANY
115 OHIO STREET · MINSTER, OHIO

SAND CONTROL



Moisture Teller *Sand Rammer* *Permeability Meter* *Strength Machine*

Measure the moisture, permeability, green strength, deformation and dry strength of molding sands.

SAND LABORATORY

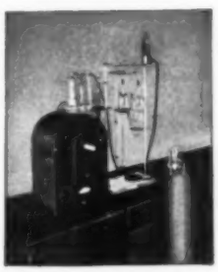
Test Work Solicited
Molding Sands—Core Sands—Silica Sands
Core Oils—Core Binders—Bonding Clays.
Elimination of Casting Defects.

HIGH TEMPERATURE

Sinter-Meter *Dilatometer*

Reduce all casting surface defects and hot tears by controlling elevated temperature sand properties with Dilatometer

MODERN ANALYSIS



Carbon Determinator

Use cast specimens for carbon and sulphur determinations and save time. This is made practical with our specimen mold.

Accurate carbon determinations made in two minutes with the Carbon Determinator.

Accurate sulphur determinations made in three minutes with the Sulphur Determinator.

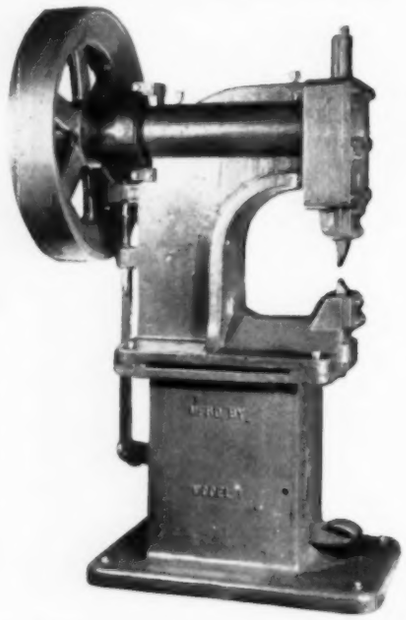
Accurate spectrographic analysis of metals in eight minutes.

Write to

HARRY W. DIETERT CO.
9330A Roselawn Ave.
DETROIT, MICH.

SPRUE CUTTERS ★ **NEW!**

for IMMEDIATE DELIVERY



2 SIZES

MODEL "H"
capacity 3 4"
sq common brass
9" depth of throat
Height O A 5'3"
Weight 1025 lbs.

●

MODEL "I"
capacity 1-1 4"
sq common brass
13" depth of throat
Height O A 6 ft.
Weight 2400 lbs.

●

Write, Wire or Phone
PROspect 8770

Scully Machinery & Equipment Corp.
(Formerly—Fdy. Division Scully-Jones & Co.)
NEW *Warehouse and Office* → 2031 West 74th Street Chicago, Illinois

THE
JACKSON IRON & STEEL
COMPANY
Manufacturers of
"JISCO"
SILVERY
PIG IRON SPECIALTIES
■
JACKSON OHIO

POLLY BRAND
"Speaks for itself"

ESPECIALLY MADE
FOR STEEL CASTINGS
POLLY
HI-TEMP COTE
(HIGH TEMPERATURE)
CORE & MOLD WASH
TEST IN YOUR SHOP
Write Today

POLLARD
OIL PRODUCTS COMPANY
1627 SOUTH 44th ST. MILWAUKEE, WIS.

WHERE-TO-BUY

DIES
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O.

DRILLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.

DRILL PRESSES
Delta Mfg. Co., Industrial Div., 620 E. Vienna Ave., Milwaukee, Wis.

DRIVES (Chain)
Chain Belt Co., Milwaukee, Wis.

DRUMS (Magnetic)
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

DRYERS—See SAND DRYERS

DUST ARRESTING EQUIPMENT
American Air Filter Co., Inc., 266 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Buell Engineering Co., 14 Cedar St., New York, N. Y.
Cleveland Blow Pipe & Mfg. Co., 6505 Cedar Ave., Cleveland, Ohio.
R. C. Mahon Co., 8650 Mt. Elliott Ave. Detroit, Mich.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Corp., Cleveland, O.
Ruemelin Mfg. Co., 3850 N. Palmer St., Milwaukee, Wis.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

ELEVATORS
Standard Conveyor Co., North St. Paul, Minn.

ELEVATORS (Bucket)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Manhattan Rubber Mfg. Div. of Raybestos Manhattan Inc., Passaic, N. J.

ELEVATORS (Material Handling)
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.

ELEVATORS (Pneumatic, Material Handling)
Fuller Company, Catasaqua, Pa.

ENGINEERING SERVICE (Foundry)
Edwin S. Carman, Lee Rd. at Mayfield, Cleveland, O.
Chas. C. Kawin Co., 431 S. Dearborn St., Chicago, Ill.
A. A. Wickland Co., 205 W. Wacker Dr., Chicago, Ill.

EXHAUST SYSTEMS
American Air Filter Co., Inc., 266 Central Ave., Louisville, Ky.
Pangborn Corporation, Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

EYE SHIELDS and GOGGLES—See Goggles

FACINGS
Delta Oil Products Co., Milwaukee, Wis.
Frederic B. Stevens, Inc., Detroit, Mich.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia, Pa.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

FACINGS (Cont'd.)
United States Graphite Co., Saginaw, Mich.
E. J. Woodison Co., 7515 St. Aubin Ave., Detroit, Mich.

FANS (Ventilating, Exhaust, Cooling, etc.)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
General Blower Co., 406 N. Peoria St., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.

FEEDERS (Rotary)
Fuller Company, Catasaqua, Pa.

FEEDERS (Sand)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.

FERROCHROME
Hickman-Williams & Co., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Ohio Ferro-Alloys Corp., Canton, O.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

FERROMANGANESE
Bethlehem Steel Co., Bethlehem, Pa.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Ohio Ferro-Alloys Corp., Canton, O.

FERROMOLYBDENUM
Climax Molybdenum Co., 500 Fifth Ave., New York, N. Y.
Molybdenum Corporation of America, Pittsburgh, Pa.

FERROSILICON
Electro Metallurgical Sales Corp., Globe Iron Co., Jackson, Ohio. 30 E. 42nd St., New York, N. Y.
Jackson Iron & Steel Co., Jackson, O.
Ohio Ferro-Alloys Corp., Canton, O.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

FERROTITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

FERROTUNGSTEN
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

FERROVANADIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.
Vanadium Corp., of America, 420 Lexington Ave., New York, N. Y.

FILMS (X-Ray)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

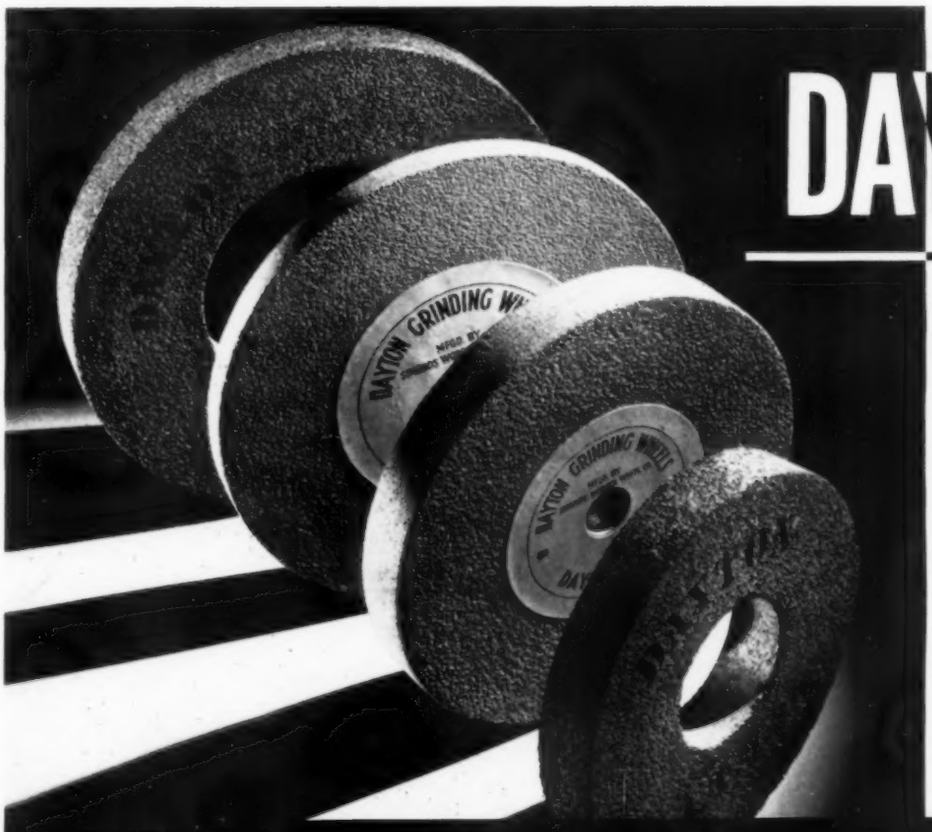
FILTERS (Air)
American Air Filter Co., 266 Central Ave., Louisville, Ky.
Staynew Filter Co., 7 Centre Pk., Rochester, N. Y.

FILTERS (All Types)
Staynew Filter Co., 7 Centre Pk., Rochester, N. Y.

FIRE BRICK
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Frederic B. Stevens, Inc. Detroit, Mich.
Haws Refractories Co., Johnstown, Pa.
Illinois Clay Products Co., Joliet, Ill.
Norton Co., Worcester, Mass.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia, Pa.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, O.

FIRE CLAY
Delhi Foundry Sand Co., Cincinnati, O.
Eastern Clay Products, Inc., Eifort, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.

—When writing advertisers, please mention THE FOUNDRY—



DAYTON

GRINDING WHEELS

Special grades and grains for your snagging and rough grinding. We will appreciate an opportunity to discuss your grinding problems with you.

SIMONDS WORDEN WHITE CO., Dayton, Ohio

● 32nd YEAR

LIQUID BINDARENE

AN ORGANIC CORE BINDER

MAKES STRONG CORES — BAKES QUICKLY — SHAKES OUT CLEAN
ORDERS SHIPPED WITHIN 48 HOURS FOR WAR INDUSTRIES

Additional Jobber Connections may be arranged

— Correspondence Invited —

INTERNATIONAL PAPER COMPANY

220 EAST 42nd STREET — *Bindarene Sales Department* — NEW YORK, N. Y.

PATTERN LUMBER

RIETZ LUMBER COMPANY

1800 NORTH CENTRAL PARK AVE., CHICAGO, ILL.

Complete Assortments

PROPERLY – CONDITIONED – LUMBER

(we operate our own dry kilns)

PINE — FOR INDUSTRIAL USE — PINE

ALL KINDS—ALL SIZES

Featuring

NORTHERN WHITE PINE & HONDURAS MAHOGANY

"BRANFORD" FLASK RAPPER

★ The "Branford" Flask Rapper entirely eliminates flask breakage and reduces shakeout time to a minimum.

★ Can be easily moved to any part of the foundry where it is desired to perform the shakeout.

★ Made in sizes that will shakeout flasks 2′ square up to 20′ x 24′ x 4′ deep. Jaw construction will take wide variation of flask flanges without change.

Write Dept. 5 for questionnaire.

NEW HAVEN VIBRATOR CO.
131 Chestnut Street
NEW HAVEN, CONN.

SCIENTIFIC MATCH PLATES
Pressure Cast

You GET
True Reproductions.
Accurate Partings.
Lower Plate Cost.

You SAVE
Expensive Pattern Duplication.
Excessive Cleaning Costs

You AVOID
Center Shrinks, Draws at Parting

The SCIENTIFIC CAST PRODUCTS Corp.
CLEVELAND, O.
CHICAGO, ILL.

A NEW NOZZLE

Made of ceramic and synthetic products. Outlasts six to seven of old style cast iron type.

Write for Particulars

GEORGE PFAFF, INC.
11-02 Jackson Avenue **Long Island City, N. Y.**

WHERE-TO-BUY

FIRECLAY (Cont'd.)
Illinois Clay Products Co., Joliet, Ill.
Lawrence Clay Co., 112 Columbia St., Jackson, O.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, O.

FIRE SAND
Carborundum Co., Niagara Falls, N. Y.

FIRESTONE
Cleveland Quarries Co., 1125 Builders Exchange Bldg., Cleveland, O.
Delhi Foundry Sand Co., Cincinnati, O.

FLASKS (Aluminum)
Adams Co., 700 Foster St., Dubuque, Ia.
The American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Fremont Flask Co., Fremont, O.

FLASKS (Dowmetal)
American Foundry Equipment Co., 505 So. Byrkit St., Mishawaka, Ind.
Fremont Flask Co., Fremont, O.

FLASKS (Slip)
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Fremont Flask Co., Fremont, O.
Freeman Supply Co., Toledo, O.

FLASKS (Snap)
Adams Co., 700 Foster St., Dubuque, Iowa.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Arcade Manufacturing Co., Freeport, Ill.
Diamond Clamp & Flask Co., Richmond, Ind.
Frederic B. Stevens, Inc., Detroit, Mich.
Fremont Flask Co., Fremont, O.

FLASKS (Steel)
Sterling Wheelbarrow Co., 7100 W Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

FLASKS (Tapered)
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Fremont Flask Co., Fremont, O.

FLASK FITTINGS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

FLASK LUMBER
Dougherty Lumber Co., 4300 E. 68th St., Cleveland, O.
Reitz Lumber Co., 1800 N. Central Park Ave. Chicago, Ill.
Thomas & Proetz Lumber Co., 3400 N. Hall St., St. Louis, Mo.

FLEXIBLE SHAFT MACHINERY
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.
Stow Mfg. Co., 23 Shear St., Binghamton, N. Y.

FLOORING (Non-Slip)
Norton Co., Worcester, Mass.

FLUXES
Foundry Services Inc., 280 Madison Ave., New York, N. Y.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.
National Gypsum Co., Buffalo, N. Y.
Niagara Falls Smelting & Refining Corp., 2204 Elmwood Ave., Buffalo, N. Y.

FLUXES (Welding)
Eutectic Welding Alloys Inc., 40 Worth St., New York, N. Y.

FOUNDRY SUPPLY HOUSES
Combined Supply & Equipment Co., Inc., 215 Chandler St., Buffalo, N. Y.
Eastern Clay Products, Inc., Eifort, O.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Midwest Foundry Supply Co., Edwardsville, Ill.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.

FOUNDRY SUPPLY HOUSES—(Cont'd.)
Frederic B. Stevens, Inc., Detroit, Mich.
E. J. Woodison Co., 7515 St. Aubin Ave., Detroit, Mich.

FURNACES, (Aluminum & Magnesium Billets)
Despatch Oven Co., Minneapolis, Minn.

FURNACES, (Aluminum & Magnesium Forgings)
Despatch Oven Co., Minneapolis, Minn.

FURNACES, (Aluminum Rivet Heating)
Despatch Oven Co., Minneapolis, Minn.

FURNACE LININGS
Campbell-Hausfeld Co., Harrison, O.
Carborundum Co., Niagara Falls, N. Y.
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Ramtite Company, Div. of S. Obermayer Co., 2563 West 18th St., Chicago, Ill.
United States Graphite Co., Saginaw, Mich.

FURNACES (Annealing)
Despatch Oven Co., Minneapolis, Minn.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.

FURNACES (Crucible Melting)
Ajax Metal Co., Philadelphia, Pa.
Campbell-Hausfeld Co., 300-320 Moore St., Harrison, O.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Mahr Mfg. Co. Div. of Diamond Iron Wks. Inc., Dept. F-10, Minneapolis, Minn.

FURNACES (Electric Melting)
Ajax Metal Co., Philadelphia, Pa.
American Bridge Co., Pittsburgh, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Swindell-Dressler Corp., Pittsburgh, Pa.

FURNACES (Gas or Oil Fired)
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.
Lee Wilson Sales Corp., 1370 Blount St., Cleveland, O.

FURNACES (Heat Treating)
Despatch Oven Co., Minneapolis, Minn.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.

FURNACES, Heat Treating (Electric)
Despatch Oven Co., Minneapolis, Minn.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.

FURNACES, Heat Treating (Oil or Gas)
Despatch Oven Co., Minneapolis, Minn.

FURNACES (Gray Iron Melting)
American Bridge Co., Pittsburgh, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.

—When writing advertisers, please mention THE FOUNDRY—

ESTABLISHED 1788

THE E. & G. BROOKE IRON COMPANY

◆

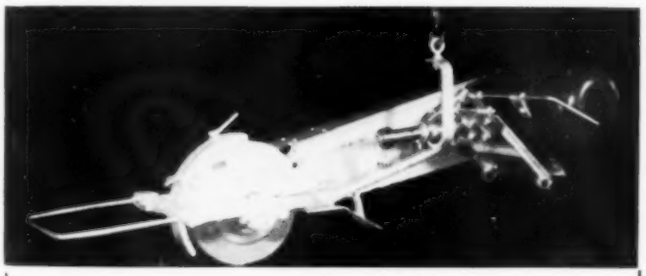
Manufacturers of

Basic, Malleable, Foundry, Forge and Low Phosphorus Pig Iron

◆

BIRDSBORO, PENNSYLVANIA

WE WISH WE COULD MAKE DELIVERIES TOMORROW!



Currently our plant is running at full capacity in the production of precision built FOX HI-SPEED GRINDERS. Like all plants directly concerned with the success of our war program, we are extremely anxious to make deliveries on your machines as soon as possible. However, we request your co-operation in bearing with us if your orders are delayed in delivery. It is not a case of neglect on our part. Be assured of our continuous efforts to keep our raw materials adequate to produce your HI-SPEED GRINDERS without delay. Meanwhile, don't forget to consult with us at any time on proper maintenance of any of our machines you may have right now.

●

FOX GRINDERS, INC.

OLIVER BLDG., PITTSBURGH, PA.

★ In one of their recent bulletins on hoists, the National Safety Council says:

> *"Hooks which have become bent on account of overloading should not be straightened and put back in service, but a new hook should be provided. When a hook is once bent the stress in the metal tends to weaken it so that afterward its strength is a matter of doubt and cannot be depended upon."*

That's good advice. With the lives of American boys utterly dependent upon our industrial production, this is no time to take chances which may cause lost time accidents to men or machines, or both.

Watch the Hooks. Wright load hooks are drop-forged from special steel which, when subjected to excessive overloading, give visible warning by opening slowly. When the bottom hook has started to open, look to the top hook, too, for while it is stronger than the bottom hook, it also may be reaching a danger point.

Don't Abuse Your Hoist. Now that we are all faced with restrictions and shortages proper maintenance is of paramount importance. While every **WRIGHT HOIST** is built with load-carrying factors considerably in excess of their rated capacities, like many other well-made pieces of mechanical equipment built for specific duty, they should not be overloaded. Overloading is dangerous—to men, materials, machinery and steady production. Remember—abuse to machinery today is akin to sabotage. Conserve steel and maintain production schedules by careful use, regular inspection and proper lubrication.

WRIGHT MANUFACTURING DIVISION
YORK, PA. CHICAGO SAN FRANCISCO NEW YORK

In Business for Your Safety

AMERICAN CHAIN & CABLE COMPANY, Inc.
BRIDGEPORT • CONNECTICUT

AVOID MAKE-OVERS!

Insure SOUND CORE SUPPORT in heavy base casting work With

CLEVELAND CHAPLETS

DEPENDABLE - - SINCE 1890

Sound, dependable core support is an important contribution to the production of perfect castings so urgently needed in war production.

USE CLEVELAND CHAPLETS! Our line includes Stem Chaplets, Double Head Chaplets, Patented Coil Head Radiator Chaplets, Square Head Radiator Chaplets, etc. Write for samples.

CLEVELAND CHAPLET & MFG. CO.

West 67th St. & N. Y. C. Ry. Cleveland, Ohio

Are You Fooling Yourself Too?

Are you accepting established routine procedures without question?

For instance, are you using acetylene in cylinders? Or have you investigated the 50 % saving in the use of SIGHT FEED Acetylene Generators.

Remember SIGHT FEED has portable or stationary installations to take care of your exact needs.

Get the facts! Write today for complete story.

SIGHT FEED GENERATOR CO., Richmond, Ind.

QUALITY CORES EQUALS More Armaments

Insert

SMILLIE **VENTS**

FOR BLOWING CORES

Sizes from ¼" to 1" in $\frac{1}{16}$" steps

C. M. SMILLIE & CO.

1100 Woodward Heights Blvd. Ferndale, Mich.

WHERE-TO-BUY

FURNACES (Gray Iron Melting) (Con'd.)
Swindell-Dressler Corp., Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Malleable)
Mahr Manufacturing Co. Div., Diamond Iron Works Inc., Dept. F-10, Minneapolis, Minn.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.

FURNACES (Malleable Annealing)
General Electric Co., Schenectady, N. Y.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

FURNACES (Malleable Melting)
American Bridge Co., Pittsburgh, Pa.
Pittsburgh Lectromelt Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Nonferrous Melting)
Ajax Metal Co., Philadelphia, Pa.
Campbell-Hausfeld Co., 300-320 Moore St., Harrison, O.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Stroman Furnace & Engineering Co., Franklin Park, Ill.
Swindell-Dressler Corp., Pittsburgh, Pa.

FURNACES (Powdered Coal)
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

FURNACES (Steel Melting)
American Bridge Co., Pittsburgh, Pa.
Detroit Electric Furnace Div. of Kuhlman Electric Co., Bay City, Mich.
Swindell-Dressler Corp., Pittsburgh, Pa.

FURNACE BLOWERS
Campbell-Hausfeld Co., Harrison, O.
Fisher Furnace Co., Dept. B, 1742 N. Kolmar Ave., Chicago, Ill.
Roots-Connersville Blower Corp., 106 Madison Ave., Connersville, Ind.

GAGES
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O.
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

GAGGERS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

GANNISTER
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.

GAS (Oxygen, Acetylene, Industrial)
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

GAS BURNERS
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Mahr Mfg. Co., Div., Diamond Iron Wks. Inc., Minneapolis, Minn.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

GLOVES (Industrial, Safety)
American Optical Co., Southbridge, Mass.
Industrial Gloves Co., 203 Garfield Blvd., Danville, Ill.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

GOGGLES and EYE PROTECTORS
American Optical Co., Southbridge, Mass.
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

GRAPHITE
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
United States Graphite Co., Saginaw, Mich.

GRINDER CENTERS
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

GRINDERS (Electric Portable)
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Stow Mfg. Co., 23 Shear St., Binghamton, N. Y.
U. S. Electrical Tool Co., Cincinnati, O.

GRINDERS (Face)
Diamond Machine Co., 2418 Aramingo St., Philadelphia, Pa.

GRINDERS (Flexible Shaft)
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.

GRINDERS (Pneumatic Portable)
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.

GRINDERS (Surface, Bench, Disc, Floor)
Delta Mfg. Co., Industrial division, 620 E. Vienna Ave., Milwaukee, Wis.
Fox Grinders, Inc., Oliver Bldg., Pittsburgh, Pa.
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.
Safety Grinding Wheel & Mach. Co., Springfield, Ohio.
U. S. Electrical Tool Co., Cincinnati, O.
Vonnegut Moulder Corp., 1839 Madison Ave., Indianapolis, Ind.

GRINDERS (Swing Frame)
Fox Grinders, Inc., Oliver Bldg., Pittsburgh, Pa.
Jefferson Machine Tool Co., Cincinnati, O.
Mall Tool Co., 7720 South Chicago Ave., Chicago, Ill.
Safety Grinding Wheel & Mach. Co., Springfield, Ohio.
Vonnegut Moulder Corp., 1839 Madison Ave., Indianapolis, Ind.

GRINDING WHEEL DRESSERS
Carborundum Co., Niagara Falls, N. Y.
Desmond-Stephan Mfg. Co., Urbana, O.
Simonds Worden White Co., Dayton, O.

GRINDING WHEELS—See ABRASIVE WHEELS

GRINDSTONES
Sterling Grinding Wheel Co., Tiffin, O.
Bay State Abrasive Products Co., Westboro, Mass.

GRIT (Abrasive)
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind
American Steel Abrasives Co., Galion, O.
Carborundum Co., Niagara Falls, N. Y.
Dreisbach Engineering Corp., 45 Warburton Ave., Yonkers, N. Y.
Pangborn Corp., Hagerstown, Md.
Globe Steel Abrasive Co., Mansfield, O.
Pittsburgh Crushed Steel Co., Pittsburgh, Pa.
Simonds Worden White Co., Dayton, O.

HAMMERS (Chipping)
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.

HAMMERS (Rawhide)
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

HAND PADS (Leather)
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill

—When writing advertisers, please mention THE FOUNDRY—

Acme -for Accuracy

☆ Specialization of high degree—in modern equipment—in experienced personnel—makes Acme produced aluminum alloy castings for vital war needs outstanding in their quality and precision.

The ACME PATTERN & TOOL Co. Inc.

DAYTON • OHIO

PROCESSING • DESIGNING
ENGINEERING • TOOLS
DIES • FIXTURES • GAGES
PATTERNS • CASTINGS

Perfectly screened molding sand... Always!

. . . with "BUFFALO" Foundry Riddles

Wire cloth woven with maximum accuracy and uniformity. Standard gauge wire carefully selected for required strength. To assure longer life, only wire of full gauge before galvanizing, is used.

Complete information in new FOLDER 591-AE. Write for Free Copy.

MADE BY THE MANUFACTURERS OF INDUSTRY'S FINEST WIRE CLOTH

Buffalo WIRE WORKS CO., INC.

ESTABLISHED 1869 AS SCHEELER'S SONS

425 TERRACE BUFFALO, N. Y.

MOLDING SAND
All grades for light and heaviest castings made.

SILICA SAND
We have a grade for your particular kind of cores and sand blasting.

LAKE SAND

FIRESTONE
Sawed to fit your cupola.
Also split and standard brick sizes.

FIRECLAY
For all foundry purposes.

BENTONITE
For all foundry purposes.

FLUORSPAR
Lump or Gravel for Foundry and Steel Furnace work, also Flux for gray iron and nonferrous metals.

STEEL ABRASIVE
Shot and Grit

•

THE DELHI FOUNDRY SAND CO.
Sayler Park Station Cincinnati, Ohio

IT'S A *Smoothie*

as it purrs along removing burrs, bumps and out-croppings

EXTRA POWER FOR EXTRA SERVICE . . . and what a boon that is for the foundry which must multiply production to unheard-of records!

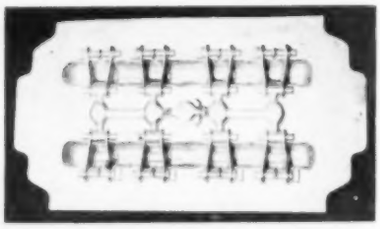
Heavy duty motors; tall bearings; one-piece chrome manganese alloy steel spindle; push button control; semi-steel wheel guards; tool rests; eye shields; water pot; shaft-locking device on spindle and other notable features.

Write for details.

Model 10

United States
HEAVY DUTY FLOOR GRINDER

THE UNITED STATES ELECTRICAL TOOL CO.
CINCINNATI, OHIO, U.S.A.



Quality Precision Pressure-Cast Plates
Cope and Drag Plates · Multiple Core Boxes
MANY YEARS EXPERIENCE IN THIS FIELD
Ask for List of Satisfied Customers—Write for Details
PLASTER PROCESS CASTINGS CO.
6922 Carnegie Ave.—Cleveland, O.

100 lbs. of ECONOMY $175
complete, shipped, ready to operate...

Here is a 5', 100-lb. Comb's Gyratory Riddle; it does the work of ten men, costs about a cent an hour to operate, and has a 20" dia. sieve held in place by a perfected clamping device. This permits removing and replacing sieve in about 5 seconds. May we suggest that you send for our descriptive catalog—it will solve your riddle riddle.

GREAT WESTERN MANUFACTURING CO.
NOT INC.
LEAVENWORTH, KANSAS

WHERE-TO-BUY

HARDNESS TESTING EQUIPMENT
Harry W. Dietert Co., 9330A Rosalawn Ave., Detroit, Mich.

HEAT CONTROL AND RECORDING DEVICES
Foxboro Co., Foxboro, Mass.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.

HEATERS (Direct Fired)
Despatch Oven Co., Minneapolis, Minn.

HEATERS (Indirect Fired)
Despatch Oven Co., Minneapolis, Minn.

HEATERS (Gas, Oil, Electric)
Despatch Oven Co., Minneapolis, Minn.

HEATERS (Space, Unit, Oven, Water)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.

HELMETS (Blasting)
American Foundry Equipment Co., 505 Byrkit St., Mishawaka, Ind.
American Optical Co., Southbridge, Mass.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

HELMETS (Welding)
American Optical Co., Southbridge, Mass.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

HOISTS (Air)
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.

HOISTS (Chain)
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Wright Manufacturing Division of American Chain & Cable Co., Inc., York, Pa.

HOISTS (Electric)
American Engineering Co., 2418 Aramingo Ave., Philadelphia, Pa.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Conco Engineering Works, Mendota, Ill.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Shepard-Niles Crane & Hoist Corp., 360 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.
Wright Manufacturing Division of American Chain & Cable Co., Inc., York, Pa.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.

HOSE (Air, Blasting, Water, Gas)
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.
Manhattan Rubber Mfg. Div. of Raybestos, Manhattan, Inc., 77 Townsend St., Passaic, N. J.
Pangborn Corp., Hagerstown, Md.

HYDRAULIC CLEANING EQUIPMENT
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.

ILLUMINATORS (X-Ray Film)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

IDLERS—See CONVEYORS, Belt

INGOTS (Nonferrous)
Ajax Metal Co., Philadelphia, Pa.
American Brass Co., 25 Broadway New York, N. Y.
International Nickel Co. Inc., 67 Wall St., New York City.

INSULATION (Rock Wool)
National Gypsum Co., Buffalo, N. Y.

IRON CEMENT
Smooth-On Mfg. Co., 570 Communipaw Ave., Jersey City, N. J.

IRON ORE
Bethlehem Steel Co., Bethlehem, Pa.
Pickands, Mather & Co., Cleveland, O.

IRON OXIDES
Delta Oil Products Co., Milwaukee, Wis.
Pollard Oil Products Co., 1627 So. 44th St., Milwaukee, Wis.
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

JACKETS (Mold)
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Fremont Flask Co., Fremont, O.

LABORATORY EQUIPMENT (Chemical)
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
Harry W. Dietert Co., 9330A Rosalawn Ave., Detroit, Mich.

LABORATORY EQUIPMENT (Physical)
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
Harry W. Dietert Co., 9330A Rosalawn Ave., Detroit, Mich.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Norton Co., Worcester, Mass.

LADLES
Bethlehem Steel Co., Bethlehem, Pa.
Industrial Equipment Co., Minster, O.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Frederic B. Stevens, Inc., Detroit, Mich.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

LADLE HEATERS
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.

LAGGING LUMBER
Dougherty Lumber Co., 4300 E. 68th St., Cleveland, O.

LATHE CENTERS
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

LEGGINGS
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

LIMESTONE
Bethlehem Steel Co., Bethlehem, Pa.

MIXER LADLE
Ramtite Company, Div. of S. Obermayer Co., 2563 West 18th St., Chicago, Ill.

LINSEED OIL
Hercules Powder Co., 999 Market St., Wilmington, Del.
Penola Inc., Pittsburgh, Pa.

LOADERS
Clearfield Machine Co., Clearfield, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

LUBRICANTS (Industrial)
Penola Inc., Pittsburgh, Pa.
United States Graphite Co., Saginaw, Mich.

LUBRICATORS (Air Line)
Jas. A. Murphy & Co., Hamilton, Ohio.
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.

MAGNETS
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

—When writing advertisers, please mention THE FOUNDRY—

COULAC
(POWDER)

GLUTRIN
(LIQUID)

WRITE TODAY for booklets containing *practical* information regarding the use of these two
OUTSTANDING SAND BINDERS

ROBESON PROCESS COMPANY
AMERICAN GUM PRODUCTS COMPANY

General Offices:
500 Fifth Ave., New York City

You Can't Beat the Combination of
SYNTRON
"PULSATING MAGNET" VIBRATORS
AND
"VIBRA-FLOW" FEEDERS

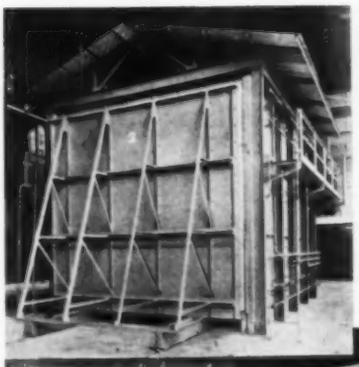
For Dependable Operating Efficiency and Major Labor Savings.

Vibrators on the bins to keep their contents Agitated and Free Flowing

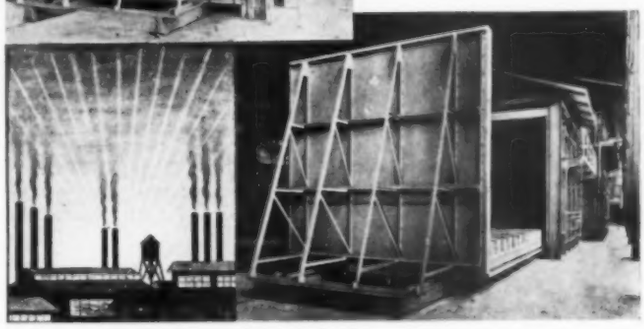
Vibrating Feeders under the bins to regulate their discharge by rheostat control of rate of Flow

Investigate the Many Advantages

SYNTRON CO.
540 Lexington Ave. Homer City, Pa.



Speeding-up Deliveries of Materials for War!



VULCAN FURNACES

incorporate certain principles of design, construction and control that insure an appreciable reduction in the heating-holding-cooling cycle for all heat treating operations . . . an important reason for their installation in major war production plants.

Above are shown two of a group of large VULCAN Furnaces recently installed in a prominent east coast plant producing equipment designed to help our Navy *"speak with authority"*.

VULCAN Furnaces are custom-built to assure maximum efficiency and economy in Normalizing, Annealing, Stress Relieving and other Heat Treating operations; Forging, Melting and special Heating work.

Write for complete information or ask to see our representative.

VULCAN CORPORATION
1797 CHERRY STREET, PHILADELPHIA, PA.

LEAK PROOF AIR GUNS

For MOLDING - CORE MAKING - MACHINE SHOPS

and all applications for blowing dirt, dust, chips, etc.

Patented

EXCLUSIVE DESIGN

SAVES AIR
No Packing Glands

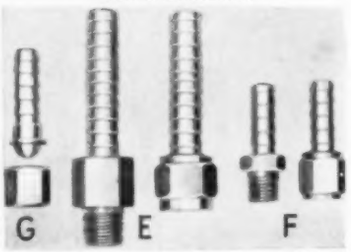
EASY TO USE
No External Levers

SIMPLE DESIGN
Low Maintenance

Only Air-O-Chek Blow Guns have the internal lever that operates valve through ball and socket joint. Gives full air discharge with only slight flex of hose. Keeps working without attention. Positive leakproof shut-off prevents air waste.

Don't be misled by guns that resemble Air-O-Cheks. Repeat orders by the hundreds show Air-O-Cheks really do a job.

Try one and see the difference. Sample on Approval.



Fittings for Air and Welding Hose. Standard and extra long Shanks. Catalog on request.

AIR-WAY PUMP & EQUIP. CO., 405 So. Jefferson St., Chicago

A. A. WICKLAND & CO.

Foundry Engineers

Continuously Since 1919

Designers of modern foundries and manufacturing plants.

Complete engineering service.

Clients of national prominence will attest to our ability.

ENGINEERING BUILDING · CHICAGO

Telephone Dearborn 9344

THE JEFFERSON GYRATORY FOUNDRY RIDDLE . . . 20" SIEVE

(Also 24" Size)

riddles sand faster than one can shovel it into the sieve!

Weighing only 135 lbs., it can be shifted about with ease. Suitable for screening molding and core sands, for medium, fine and coarse dry materials. This riddle mixes while sifting, saving one turn of the sand. Correct gyratory motion eliminates vibration.

We also manufacture Turret Attachments, Swing Frame Grinders Belt Sanders. Milling Machines, Milling Machine Dividing Heads, and Vises. Let us mail bulletin giving full details.

JEFFERSON MACHINE TOOL CO.

Fourth, Cutter and Sweeney Streets

CINCINNATI, OHIO

WHERE-TO-BUY

MALLETS (Rawhide)
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

MANGANESE (Briquets)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

MANIFOLDS (Oxy-Acetylene)
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

MATCHPLATES
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Plaster Process Castings Co., 6922 Carnegie Ave., Cleveland, O.
Scientific Cast Products Corp., 1388-92 E. 40th St., Cleveland, O.

MAULS
Chicago Rawhide Mfg. Co., 1384 Elston Ave., Chicago, Ill.

METALLOGRAPHIC EQUIPMENT
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.

METALLURGISTS
Chas. C. Kawin Co., 431 So. Dearborn St., Chicago, Ill.

METERS (Gas, Air, Water)
Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago, Ill.
Roots-Connersville Blower Corp., Connersville, Ind.

MICROSCOPES
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.

MITRE SAW BENCHES
Tannewitz Works, Grand Rapids, Mich.

MIXERS (Core Wash)
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

MIXERS (Sand and Clay)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

MOLD CONVEYORS
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

MOLD DRYERS
Hauck Mfg. Co., 106 Tenth St., Brooklyn, N. Y.

MOLD OVENS and DRYERS
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Lanly Company, 750 Prospect Ave., Cleveland, O.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

MOLDING MACHINES
Arcade Manufacturing Co., Freeport, Ill.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Berkshire Mfg. Co., 1111 Power Ave., Cleveland, O.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.

MOLDING MACHINES (Cont'd.)
Davenport Machine & Foundry Co., Davenport, Iowa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Johnston & Jennings Co., 867 Addison Rd., Cleveland, O.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Moline Iron Works, 228 Second St., Moline, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Pioneer Mfg. Co., West Allis, Wis.
S P O Incorporated, 7500 Grand Division Ave., Cleveland, O.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

MOLDING MACHINES (Jolt)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
Johnston & Jennings Co., 867 Addison Rd., Cleveland, O.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
S P O Incorporated, 7500 Grand Division Ave., Cleveland, O.

MOLDING MACHINES (Rollover)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Johnston & Jennings Co., 867 Addison Rd., Cleveland, O.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
S P O Incorporated, 7500 Grand Division Ave., Cleveland, O.

MOLDING MACHINES (Squeeze)
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O.
Adams Company, 700 Foster St., Dubuque, Iowa.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Johnston & Jennings Co., 867 Addison Rd., Cleveland, O.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Moline Iron Works, 228 Second St., Moline, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
S P O Incorporated, 7500 Grand Division Ave., Cleveland, O.

MOLDING SANDS
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Midwest Foundry Supply Co., Edwardsville, Ill.
Ottawa Silica Co., Ottawa, Ill.

MOLD WASH
Dayton Oil Co., Dayton, O.
Delta Oil Products Co., Milwaukee, Wis.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Pollard Oil Products Co., 1627 So. 44th St., Milwaukee, Wis.
United States Graphite Co., Saginaw, Mich.

—When writing advertisers, please mention THE FOUNDRY—

"CERTIFIED" STEEL ABRASIVES

PITTSBURGH CRUSHED STEEL CO.

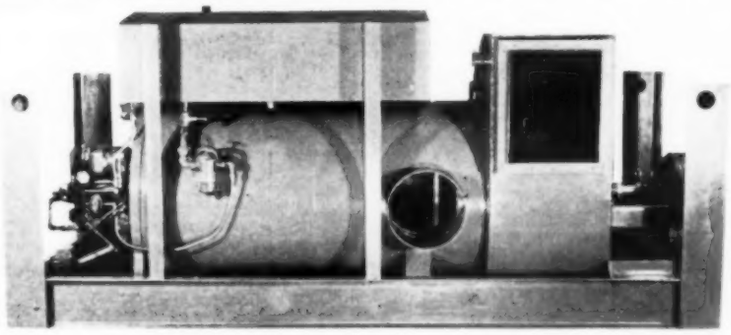
PITTSBURGH, PENNA.

STEEL SHOT AND GRIT CO.

BOSTON, MASS.

Reduce Mold Drying Time 50 to 75% with

PORBECK Mold Dryers



PORBECK AIR RECIRCULATING MOLD DRYERS — Oil or Gas Fired

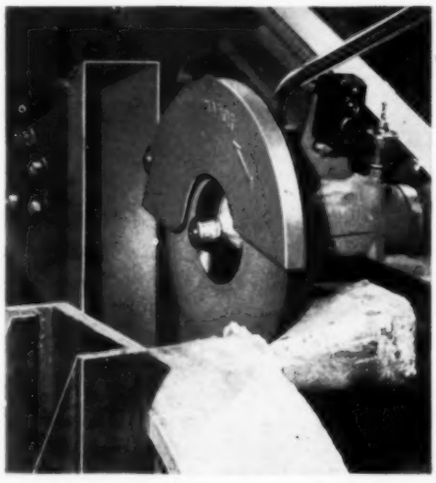
● These are self contained portable units, and can be moved around the foundry with a crane. Fully automatic. Requires no attention throughout the drying time.

Heater starts to dry the mould as soon as it is turned on. No time required to build up heat.

The mould is dried from the inside. Heated air passes over all inside surfaces of the mould, drying uniformly throughout and produces a clean mould without burnt spots or damp spots.

Write for Bulletin "F"

PORBECK MANUFACTURING CO.
2019 N. Broadway St. Louis, Mo.



WEST CUT-OFF WHEELS

The only wheel developed especially for the cutting of gates and risers

THERE IS A WEST WHEEL FOR EVERY NONFERROUS, STEEL OR IRON CUTTING JOB

THE WEST COMPANY

1117 SHACKAMAXON ST., PHILADELPHIA, PA.

PENN DUMPING BUCKETS

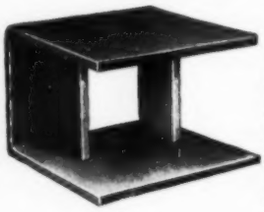
No. S-A

Careful balancing makes Penn Buckets self dumping when loaded and self righting when empty. Careful construction prevents "clinging" makes them easily emptied.

WRITE TODAY FOR NEW BULLETIN DIMENSION SHEET AND PRICE LIST.

PENN IRON WORKS
READING, PENNA.

CHAPLETS



The Buffalo "DOUBLE ANGLE" chaplet is a strong, well made single piece, is carefully tinned, fuses readily and does not chill. Four different gauges for light, medium and heavy work. Write for complete information on our full line of chaplets. Samples and prices gladly sent.

"DOUBLE ANGLE"

COMBINED SUPPLY & EQUIPMENT CO.

215 CHANDLER STREET, BUFFALO, NEW YORK

LUMBER!

NORTHERN WHITE PINE
HARD MAPLE · MAHOGANY
WALNUT · CHERRY · CYPRESS

CUT-TO-SIZE CRATING

Manufacturers
SOUTHERN YELLOW PINE and HARDWOODS

Carload or LCL shipments from our St. Louis yards or direct from our mills.

Thomas & Proetz Lumber Co.

3405 N. HALL STREET — ST. LOUIS, MO.

WHERE-TO-BUY

MOLYBDENUM
Molybdenum Corporation of America, Pittsburgh, Pa.

MONORAIL SYSTEMS
American Monorail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 194, Port Washington, Wis.

NAILS (Chill)
Bethlehem Steel Co., Bethlehem, Pa.
Republic Steel Corp., Cleveland, O.

NICKEL
International Nickel Co. Inc., 67 Wall St., New York City.

NOZZLES (Blasting)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Davenport Machine & Foundry Co., Davenport, Iowa.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Norton Co., Worcester, Mass.
Pangborn Corp., Hagerstown, Md.
George Pfaff Inc., 11-02 Jackson Ave., Long Island City, N. Y.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

OIL BURNERS
Stroman Furnace & Engineering Co., Franklin Park, Ill.

OILERS
Jas. A. Murphy & Co., Hamilton, Ohio.

OILS (Core)—See CORE OIL

OILS (Lubricating)—See Lubricants—INDUSTRIAL

Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

OPTICAL PYROMETERS
Adolph I. Buehler, 228 N. LaSalle St., Chicago, Ill.

OVENS (Annealing and Heat Treating)
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
Lindberg Engineering Co., 2453 West Hubbard, Chicago, Ill.
Mahr Mfg. Co., Div. of Diamond Iron Works Inc., Dept. F8, Minneapolis, Minn.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

OVENS (Core)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
The Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Cleveland Blow Pipe & Mfg. Co., 6505 Cedar Ave., Cleveland, Ohio.
Despatch Oven Co., Minneapolis, Minn.
Foundry Equipment Co., Cleveland, O.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.
Lanly Company, 750 Prospect Ave., Cleveland, O.
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
R. C. Mahon Co., 8650 Mt. Elliott Ave., Detroit, Mich.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia, Pa.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Vulcan Corporation, 18th & Cherry Sts., Philadelphia, Pa.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

OVENS (Enameling, Japanning)
Carl-Mayer Corp., 3030 Euclid Ave., Cleveland, O.
Despatch Oven Co., Minneapolis, Minn.
Gehnrich Corporation, 42-11 35th St., Long Island City, N. Y.
George Koch Sons, Inc., 2124 W. Pennsylvania St., Evansville, Ind.

OVENS (Enameling, Japanning) (Cont'd.)
Paul Maehler Co., 2200 W. Lake St., Chicago, Ill.
R. C. Mahon Co., 8650 Mt. Elliott Ave., Detroit, Mich.
Porbeck Mfg. Co., 2019 N. Broadway, St. Louis, Mo.
Young Brothers Co., 6508 Mack Ave., Detroit, Mich.

OVENS (Mold)
Despatch Oven Co., Minneapolis, Minn.

OXYGEN
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

PAPER (Abrasive)—See ABRASIVE CLOTH AND PAPER

PARTING COMPOUNDS
Delta Oil Products Co., Milwaukee, Wis.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Midwest Foundry Supply Co., Edwardsville, Ill.
National Gypsum Co., Buffalo, N. Y.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

PATTERN COMPOUND
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill

PATTERN LETTERS
Freeman Supply Co., Toledo, O.

PATTERN LUMBER
Dougherty Lumber Co., Cleveland, O.
Freeman Supply Co., Toledo, O.
Reitz Lumber Co., 1800 N. Central Park Ave., Chicago, Ill.
Thomas & Proetz Lumber Co., 3400 N. Hall St., St. Louis, Mo.

PATTERN PLATES
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O
Freeman Supply Co., Toledo, O.
Marathon Chemical Co., Div., Marathon Paper Mills Co., Rothschild, Wis.
Moltrup Steel Products Co., Beaver Falls, Pa.
Plaster Process Castings Co., 6922 Carnegie Ave., Cleveland, O
Scientific Cast Products Corp., 1388-92 E. 40th St., Cleveland, O

PATTERN PLATE STOCK
Marathon Chemical Co., Div., Marathon Paper Mills Co., Rothschild, Wis.

PATTERN SHOP EQUIPMENT
Delta Mfg. Co., Industrial division, 620 E. Vienna Ave., Milwaukee, Wis.
Freeman Supply Co., Toledo, O.
Oliver Machinery Company, Grand Rapids, Mich.

PATTERNS (Electro Copper)
Electro-Chemical Pattern & Mfg. Co., 3975 Beaufait, Detroit, Mich

PATTERNS (Wood, Metal)
Acme Pattern & Tool Co., Inc., 232 N. Findlay St., Dayton, O.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Electro-Chemical Pattern & Mfg. Co., 3975 Beaufait, Detroit, Mich.
S P O Incorporated, 7500 Grand Division Ave., Cleveland, O.

PHOTOGRAPHIC EQUIPMENT
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.

PIG IRON
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie-Illinois Steel Corp., Pittsburgh, Pa.
E. & G. Brooke Iron Co., Birdsboro, Pa.
Globe Iron Co., Jackson, Ohio.
Hanna Furnace Co., Div. of National Steel Corp., Ecorse, Detroit, Mich.
Hickman-Williams & Co., Cleveland, O.
Pickands, Mather & Co., Cleveland, O.
Republic Steel Corporation, Cleveland, O.
Woodward Iron Co., Woodward, Ala.

—When writing advertisers, please mention THE FOUNDRY—

Have You Seen This

HELPFUL LITERATURE?

***NOTE TO READERS:** If you will check the item or items described which particularly interest you, we will be glad to request the manufacturers concerned to send you their literature. Use the attached postal card*

1. Grinding Wheels

Standard Safety Equipment Co.—A reprint from "Industrial Supervisor" on grinding wheel care and safety, combined with illustrations and description of the company's line of grinding wheel safety washers, operation guards, and other safety equipment.

2. Colloidal Graphite

National Graphite Co. Inc.—4-page folder describes the company's Konag, a natural colloidal graphite. Said to be satisfactory for blending with a great majority of all lube oils and many greases.

3. Dust Recovery

Buell Engineering Co.—Interesting broadside folder illustrates the patented Tongeren principle of dust recovery as developed by the company. Typical foundry installations shown.

4. Traveling Cranes

Reading Chain & Block Corp.—16-page catalog tells the why and how of faster production, as outlined through the use of the company's traveling cranes. Well illustrated.

5. Air Tools

Rotor Tool Co. — 12-page booklet outlines the company's "Conservation Plan" giving maintenance tips that will be of assistance in keeping such tools as pneumatic and high cycle electric grinders, buffers, sanders and drills running more efficiently.

6. Drum Carriers

Ernst Carrier Sales Co.—Broadside type bulletin shows complete line of the company's drum and barrel carrier, what it does, how it works, where it is used, and who uses it.

7. Metal Conditioning

Protective Coatings, Inc. — Departmentalized booklet deals with the company's line of protective coatings including information on its metal conditioning division—degreasers, deoxidizers, corrosion inhibitors, metal primers.

8. Mechanical Conveyors

Standard Conveyor Co.—Condensed general catalog No. 307 gives 25 pages of installation photographs and pertinent specification data on the company's line of conveyors, including foundries.

9. Refractories

Electro Refractories & Alloys Corp. —96-page general catalog covers the various refractory products produced by the company including high temperature cement; crucibles; grinding wheels; stopper heads; alloys. Specific information.

10. Core Rod Dip Oil

Delta Oil Products Co.—Four-page folder is descriptive of the company's 224X core rod dip oil, said to eliminate core breakage loss and save on the number of core wires used. Describes the company's other products for foundries.

11. Electric Power Systems

General Electric Co.—Catalog GED-1006. Engineers' handy guide on the quick installation of electric power systems for new plants and plant extensions.

12. Precision Lathes

South Bend Lathe Works—Catalog No. 16 illustrates and describes the company's 16" precision lathes for tool room and quick change gear application. Construction features illustrated.

13. Copper Conservation

General Electric Co. — Publication GED-1011 gives five ways to conserve copper in war plant electrical systems. Well planned and easily understood with case studies of savings effected by the company.

14. Steel Molding Sands

American Colloid Co.—A condensed A. F. A. paper of interest concerning the properties of synthetically bonded steel molding sands. Accompanying wall chart shows green compression strength of 5% Western Bentonite; dry compression strengths, and green compression strengths with various binders with sand of 64 A. F. A. fineness.

15. Precision Machinery

Delta Mfg. Co.—Photographic type catalog shows numerous applications for the company's line of drilling, grinding and cutting equipment, including case studies of foundry usage. Well illustrated.

16. Magnesium Fires

Pulmosan Safety Equipment Corp. —Leaflet describes the company's Magout powder G-2 with instructions for use on the extinguishing of magnesium fires. Prices.

17. Lathe Operation

Sheldon Machine Co. — 103-page manual illustrates and describes to the beginner the proper care and operation of a lathe. 50c.

THE FOUNDRY
Readers' Service Dept.

SEPTEMBER
1942

Please send me the items circled below:

1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22	23	24	25
26	27	28	29	30
31	32	33	34	35
36	37	38	39	40
41				

Name _____

Title _____

Company _____

Address _____ ☐ Company? ☐ Home?

City and State _____

To be valid, this card must be completely filled out.

18. Sand Mixers

Clearfield Machine Co. — Catalog No. 75 describes and illustrates the company's complete line of sand conditioning machines designed and built for foundry use.

19. Cutting Tools

McKenna Metals Co.—New Catalog 42V covers specifications and prices of the company's Kennametal steelcutting carbide tools and blanks. Contains both line drawings and halftone illustrations of each standard type Kennametal tool.

20. Aircraft Metal

Ampco Metal Inc.—8-page bulletin is descriptive of "How Aircraft Designing Engineers Use Ampco Metal." Shows wide variety of aircraft equipment.

21. Nonferrous Foundry Ingots

Ajax Metal Co.—19-page booklet prepared in interesting form covers a description of the processing, application and specification of the company's line of nonferrous foundry ingot metals.

22. Safety Clothing

Pulmosan Safety Equipment Co.—3 bulletins. (1) Protective clothing for welders including leggings, gloves, goggles, respirators, eyeshields, etc.; (2) company's line of goggles for chippers' and grinders' goggles; (3) a general 4-page folder on company's line of respirators, goggles, gas masks, protective clothing and newly developed powder effective on magnesium fires.

23. Lighting

Curtis Lighting Inc.—88-page catalog No. 42 describes equipment offered to the trade by the company essential for ordering and installing fluorescent and incandescent lighting. Complete price list.

24. Compressors

Schramm Inc.—Copy of "Bores & Strokes" showing specific case installations of the company's line of compressors on a variety of applications.

25. Electric Motor Care

Allis-Chalmers Mfg. Co.—Maintenance handbook entitled "A Guide to Wartime Care of Electric Motors" is well prepared and contains much factual information on ways to increase the average motor's working time from 1800 to as much as 8700 hours a year.

26. Foundry Equipment

William F. Eichfeld & Sons Co.—Folder is descriptive of the company's engineering of foundry equipment to fit specific industrial problems. Illustrated by actual case examples.

27. Tool Accessories

Ideal Commutator Dresser Co.—8-page folder covers the company's line of machine tool accessories such as live centers, demagnetizers, grinding wheel dressers, electric markers.

28. Molten Salt Baths

E. I. du Pont de Nemours & Co.—72-page illustrated manual describes case hardening of ferrous metals; use of cyanide baths as reheat media nitriding high-speed steel and high alloy tool steels in molten cyanide baths.

29. Arc Welding

Air Reduction Sales Co.—14-page "fight waste" bulletin consists of a series of shop posters designed to help arc welding operators do more useful work with every electrode.

30. Industrial Electric Trucks

Crescent Truck Co.—General catalog made up of bulletins 411 to 4126 covers the company's complete line of all types and sizes of electric industrial trucks and tractors. Amply illustrated.

31. Inspection Lighting

Boyer-Campbell Co.—4-page catalog describes the company's product "Super Sight" adapted to close inspection, fine assembly and precision machining. Supplied with either 4-inch or 5-inch lenses. Various brackets for machine and bench work.

32. Foundry Conveyors

Mathews Conveyer Co.—Well-prepared 42-page catalog just off the press gives blueprints, case installations and pertinent data on the company's line of foundry conveyors. Designed to help the engineer personnaly specify on type conveyor desired.

33. Airline Equipment

Hansen Mfg. Co.—7-page illustrated folder describes the company's line of hose clamps, air blow guns, air hose couplings, hose clamp plugs, engine cleaners, sand blast cleaners, and air liquid spray guns.

34. Laboratory Filter Papers

Carl Schleicher & Schuell Co.—4-page folder descriptive of test data on the company's line of American filter papers for use in chemical laboratories. For qualitative and semi-quantitative work.

35. All-Purpose Machinery

Delta Mfg. Co.—New booklet just published covers shop photographs of the company's line of drill presses, grinders, cut-off machines, abrasive finishing machines, circular, scroll and band saws.

36. Materials Handling

Robins Conveying Belt Co.—Bulletin No. 122 illustrates and describes the company's style M and J Vibrex screens. Includes details on screening surface, dimensions of screens, and other features for vibration handling.

37. Grinding

Norton Co.—37-page booklet entitled "O. D. Grinding" presents in interesting form pertinent ABC data on outside diameter grinding with performance data charts, wheel recommendations, etc.

38. Rotary Blowers

Roots-Connersville Blower Corp.—Bulletin 22:23-B-11 covers 20 pages of informative data on the company's line of rotary positive blowers. Installation views and comment on varied applications.

39. Refractories

Chas. Taylor Sons Co.—Bulletin No. 311 gives 14 pages of specific data on the company's P.B. Sillimanite refractories. Amply illustrated. Deals with ramming mix; patch for Ajax-Northrup furnaces; air setting cement, etc.

40. Dermatitis

E. F. Houghton & Co. — 4-page folder on subject of Dermatitis, its causes and prevention in the metal working industry—a publication of the company's research staff.

41. Vibrating Screens

Universal Vibrating Screen Co.—Catalog No. 107 has 32 pages of application data, illustrations, and descriptive material on its line of vibrating screens and screening. Methods of installation, screen sections given.

FIRST CLASS
PERMIT No. 36
(Sec. 510 P.L.&R.)
CLEVELAND, O.

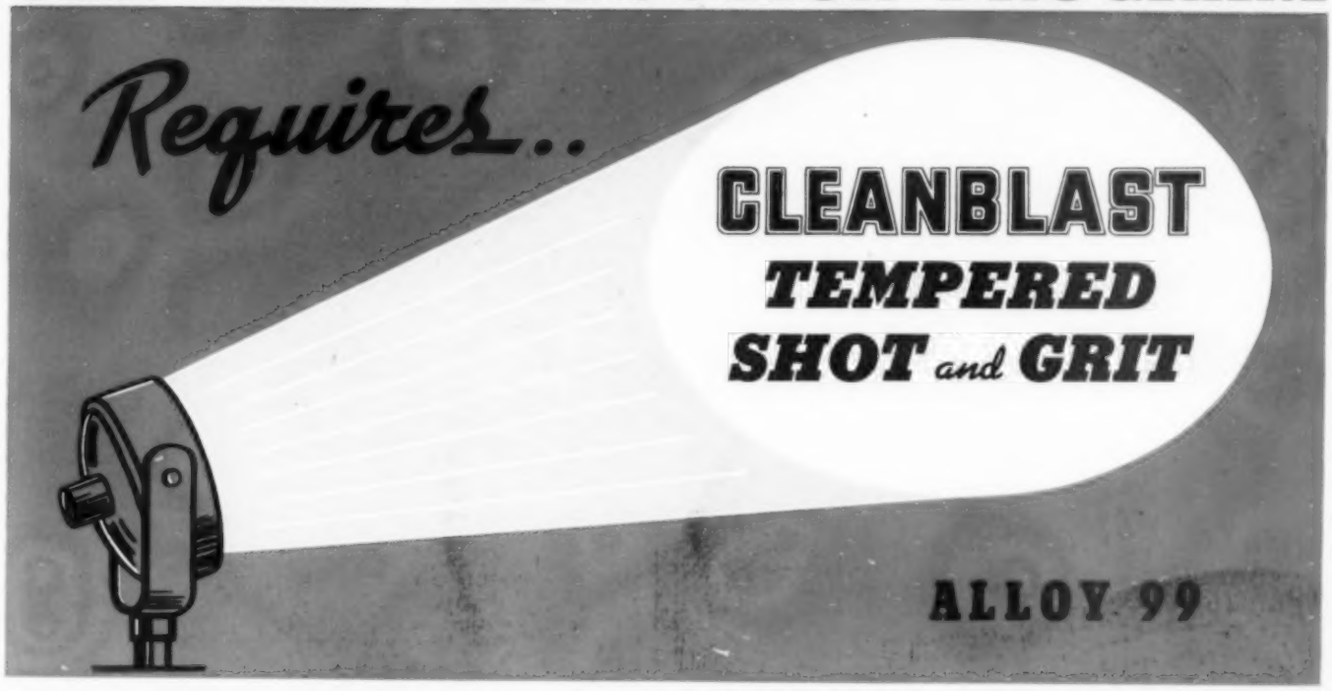
BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

2c POSTAGE WILL BE PAID BY

THE FOUNDRY
Penton Bldg., 1213 W. Third St.
CLEVELAND, OHIO

Readers' Service

THE WAR PRODUCTION PROGRAM



ALLOY METAL ABRASIVE COMPANY

311 W. HURON ST. ANN ARBOR, MICHIGAN

Rawhide HAMMERS

• As carefully made as the finest tool. Accurately balanced malleable iron heads on straight grained and polished hickory handles. Replaceable genuine Java Water Buffalo Rawhide faces which will not chip, shear, or split, providing a striking surface that is smooth and accurate to the last blow.

Cat. No.	Diameter in inches	Weight in pounds
0	1	1/2
1	1 1/4	1 1/8
2	1 1/2	1 5/8
3	1 3/4	2 1/4
4	2	4
5	2 3/4	5 1/2

These are the tough, resilient, long-lasting Rawhide faces made from specially treated Java Water Buffalo hide for use in Chicago Rawhide Hammers.

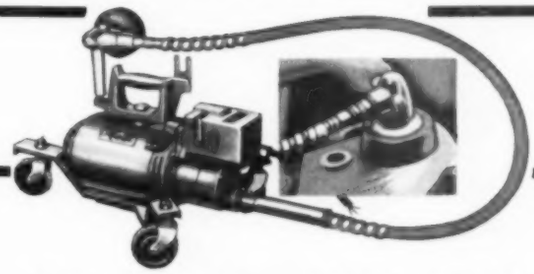
Rawhide MALLETS

• Chicago Rawhide Mallets have solid, hard rolled Java Water Buffalo Rawhide heads securely glued and riveted, fastened to hickory handles with steel forged pin. A tool that is finely balanced for accurate blows, made for long service and safe to use.

Not Loaded			
Cat. No.	Diameter Inches	Length Inches	Weight Ozs.
0	1	2 1/8	2
1	1 1/4	3	3 1/2
2	1 1/2	3 1/4	6
3	1 3/4	3 1/4	7 1/2
4	2	3 1/2	10
5	2 3/4	4 1/4	21
6	2 3/4	4 3/4	23
Loaded Mallets			
7	1 1/4	3	8
8	1 1/2	3 1/8	12
9	1 3/4	3 1/8	16
10	2	3 1/2	20
11	2 3/4	4 1/4	42

CHICAGO Rawhide MFG. CO.
13th ELSTON AVE.. ★ CHICAGO, ILLINOIS.

CONSTANT HIGH SPEED CUTS SNAGGING COSTS



Mall TRADE MARK GEARED HEAD GRINDERS

Every Foundry can handle its snagging operation faster with fewer rejects and lower abrasive costs when equipped with MALL Geared Head Grinders. They operate independently of all other tools assuring a steady flow of power. They can be rolled over rough floors right up to the work. And, in addition, every r.p.m. in the heavy-duty, 3-phase, 220-440-volt, dust and vaporproof enclosed motor is stepped up in the working tools. Thus, a working speed of 4500 r.p.m. is constantly maintained. All interchangeable attachments are light in weight, easy to handle, and can be changed in a jiffy.

MALL Geared Head Grinders with either caster base or overhead trolley mountings (hanger bail type) are available for VICTORY PRODUCTION.

Write, wire or telephone for full details.

"THROW YOUR SCRAP INTO THE FIGHT"

MALL TOOL COMPANY
7720 South Chicago Ave., Chicago, Illinois

BUY

WAR BONDS

TILL IT

HURTS—(THE AXIS)

Space by Courtesy of

M. E. CUNNINGHAM CO.

MANUFACTURERS OF MARKING DEVICES

97 E. CARSON ST. PITTSBURGH, PA.

For Better Blown Cores, Use

DEMMLER CORE BOX VENTS

PERFCRATED VENTS

No. 00, No. 0, No. 1 or No. 2 holes

SLOTTED VENTS

Brass or Steel

Slots .010" to .015"

WM. DEMMLER & BROS.

Kewanee - Illinois

WHERE-TO-BUY

PIG IRON (Silvery)

Bethlehem Steel Co., Bethlehem, Pa.
Globe Iron Co., Jackson, Ohio.
Jackson Iron & Steel Co., Jackson, O.

PINS (Flask)

Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.
Truscon Steel Co., 6100 Truscon Ave., Cleveland, O.

PISTON RINGS (for Molding Machines, Compressors, etc.)

Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.

PLATES (Bottom)

Moltrup Steel Products Co., Beaver Falls, Pa.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

PLATES (Core Drying)

Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Johns-Manville, 22 East 40th St., New York City.

PLATES (Pattern)—See PATTERN PLATES

PLUMBAGO

Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
J. S. McCormick Co., 25th St. & A.V.R.R., Pittsburgh, Pa.
Frederic B. Stevens, Inc., Detroit, Mich.
United States Graphite Co., Saginaw, Mich.

PNEUMATIC TOOLS

Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

POURING DEVICES

Modern Equipment Co., Dept. 194, Port Washington, Wis.

POWDERED COAL EQUIPMENT

Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

PROTECTIVE MATERIALS (X-Ray)

Picker X-Ray Corp., 300 Fourth Ave., New York City.

PULLEYS (Magnetic)

Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

PUMPS

Gardner-Denver Co., Gardner Drive, Quincy, Ill.

PUMPS (Dry, Vacuum)

Fuller Company, Catasaqua, Pa.

PUSH-OFF MACHINES

Champion Foundry & Machine Co., 1314 West 21st St., Chicago, Ill.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
Worthington Pump & Machy. Corp., Harrison, N. J.

PYROMETERS

Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
Illinois Testing Laboratories, Inc., 420 N. LaSalle St., Chicago, Ill.
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

RADIOGRAPHY (Industrial)

Canadian Radium & Uranium Corp., 630 Fifth Ave., New York City.
Radium Chemical Co. Inc., 570 Lexington Ave., New York, N. Y.

RADIUM

Canadian Radium & Uranium Corp., 630 Fifth Ave., New York City.
Radium Chemical Co. Inc., 570 Lexington Ave., New York, N. Y.

REFRACTORIES

Carborundum Co., Niagara Falls, N. Y.
Eastern Clay Products, Inc., Elfort, O.
Electro Refractories & Alloys Corp., 62 Andrews Bldg., Buffalo, N. Y.
Fisher Furnace Co., 1742 N. Kolmar Ave., Chicago, Ill.
Haws Refractories Co., Johnstown, Pa.
Norton Co., Worcester, Mass.
Ramtite Company, Div. of S. Obermayer Co., 2563 West 18th St., Chicago, Ill.
Chas. Taylor Sons Co., P. O. Box 58, Annex Sta., Cincinnati, O.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
United States Graphite Co., Saginaw, Mich.

REPAIR PARTS (Molding Machine)

Pioneer Mfg. Co., West Allis, Wis.

RESPIRATORS

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

RIDDLES

Buffalo Wire Works, 425 Terrace, Buffalo, N. Y.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.

RIDDLES (Electric)

Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago, Ill.
Great Western Mfg. Co., Leavenworth, Kans.
Jefferson Machine Tool Co., Cincinnati, O.

RIDDLES (Hand)

Buffalo Wire Works Co., 425 Terrace, Buffalo, N. Y.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Seymour & Peck Co., P. O. Box 5609, Chicago, Ill.

RIDDLE BOTTOMS (Gyratory)

Buffalo Wire Works Co., 425 Terrace, Buffalo, N. Y.
Seymour & Peck Co., P. O. Box 5609, Chicago, Ill.

RODS (Steel)

Republic Steel Corp., Cleveland, O.

ROD STRAIGHTENER

American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.

ROLLER-HEARTH FURNACES (Electric Annealing)

General Electric Co., Schenectady, N. Y.

RUBBER LINING MATERIAL (Abrasive Resisting)

Pangborn Corp., Hagerstown, Md.

RUST PREVENTATIVES

Penola Inc., Pittsburgh, Pa.

SAFETY CLOTHING

American Optical Co., Southbridge, Mass.
Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Pulmosan Safety Equipment Co., 176 Johnson St., Brooklyn, N. Y.

SALT and SALT TABLETS

Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa.
Morton Salt Co., 208 W. Washington St., Chicago, Ill.

SANDS (Core, Molding, Blasting)

Delhi Foundry Sand Co., Cincinnati, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Midwest Foundry Supply Co., Edwardsville, Ill.
Ottawa Silica Co., Ottawa, Ill.
Pangborn Corp., Hagerstown, Md.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.
Producers Core Sand Corp., Michigan City, Ind.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

—When writing advertisers, please mention THE FOUNDRY—

HOW YOUR ADVERTISING CAN HELP WIN THE WAR

Free Manual tells HOW

90 PAGES OF PRACTICAL HELP Demonstrates, by example, how your advertising, too, can help fight this war; help customers; help build a sound foundation for future business.

WANT FACTS? No chronicle of theories and opinions, this. "A Guide to Effective War-Time Advertising" is a factual report based upon the testimony of business leaders who have found ways to make their advertising *helpful* to their customers and prospects at a time when help is so desperately needed. It shows, too, how "oversold" companies now use "service advertising": how they do as the business paper editors do . . . *use their space to transmit important information from where it is to where it is needed.*

4,000 ordered by May 1
Get yours before they're all gone!

Useful Advertising Needs No Defenders!

We have to use
EVERYTHING WE'VE GOT
to win this war!

Good business papers are multi-purpose carriers that can convey important messages quickly, accurately, economically, to special groups of men with kindred war-time problems.

America, the world's greatest user of these vehicles of communication, has a powerful tool to use against the Axis.

By making the best possible use of business papers, now, we can strike a blow that will be felt across both oceans. "A Guide to Effective War-Time Advertising" will help you do this. One copy is yours for the asking . . . if you'll ask before they're all gone.

After you read this "Guide," you will have a new concept of what advertising can do to help America's war effort and to help your company solve its customer-relations problems, present and future. *And you will know what GOOD "institutional" advertising is!*

The "Guide" features advertisements that show some recognition of the conditions which today have *increased* rather than lessened the need for making business paper advertising *useful, informative* and *specific!* This "Guide," while comprehensive in itself, is only our introduction to a collection of case studies that will constitute a veritable WAR ALBUM. Send for it now and you'll receive additional up-to-the-minute case studies, free, as fast as they're produced.

TWO SUPPLEMENTS NOW INCLUDED!

In the first one a company head tells why his organization uses FOUR separate business paper advertising campaigns *as tools of management* to help solve difficult customer-relations problems under "sold out" conditions.

The second Supplement is Part One of a continuing study of dealers' war-time problems. It reports what distributive people are up against today and illustrates how some consumer goods manufacturers are using dealer paper advertising to speed useful suggestions and practical information that helps solve their mutual problems.

ABP

THE ASSOCIATED BUSINESS PAPERS

A national association of business publications devoted to increasing their usefulness to their subscribers and helping advertisers get a bigger return on their investment.

FREE

ASSOCIATED BUSINESS PAPERS,
Dep't. 2764, 369 Lexington Avenue, New York City
Please send, without obligation, my free copy of ABP's latest aid to advertisers, "A Guide to Effective War-time Advertising," including the supplements.

NAME _____

POSITION _____

COMPANY _____

STREET _____ CITY & STATE _____

One Week to 10 Days

IMMEDIATE DELIVERY

General Centrifugal Blowers

Designed for GAS *and* OIL BURNERS,
CORE *and* ANNEALING OVENS,
CUPOLAS *and* CRUCIBLE FURNACES

★

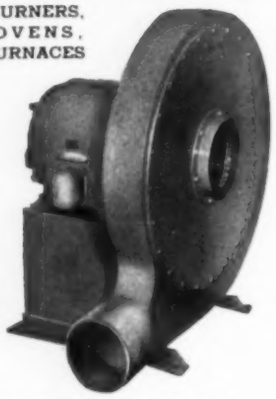
Gas Boosters

★

Cupola Blowers

WIDE RANGE OF SIZES
FOR EVERY REQUIREMENT

★



Send for NEW 8-Page Bulletin CB-101

GENERAL BLOWER COMPANY

406 N. PEORIA ST.—MONROE 0244—CHICAGO, ILL.

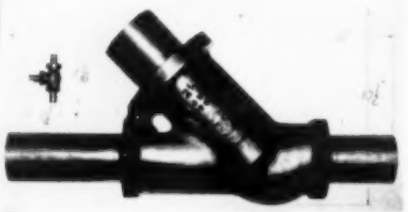
120 Liberty St. New York, N. Y. — 933 East Jefferson St. Detroit, Michigan — 1084 Lakeland Ave. Cleveland, O.

430 Frick Bldg. Pittsburgh, Pa. — P. O. Box 5010 Fox Chase, Phila., Pa.

1726 E. Washington Blvd.—PRospect 9540—Los Angeles, Calif.

COPPER PATTERNS

Made by ELECTRO FORMING



These metal patterns containing three ounces and seven pounds of deposited copper respectively, made from single shrink patterns.

Send us your working wood or metal pattern, single shrink, and we will reproduce the required number of copper patterns to fill a plate.

Accuracies two to three thousandths of an inch.

Send for Folder — *Samples upon request*

ELECTRO-CHEMICAL PATTERN & MFG. CO.

3969-3975 Beaufait Ave. — Detroit, Michigan

CARMAN ENGINEERS

SATISFIED WITH YOUR PRODUCTION??

Do your methods produce the output you desire with present plant and equipment or do hidden waste and inefficiency cut deep into monthly production? Rearrangement of equipment and improved methods will eliminate waste, reduce costs, and secure a peak production.

EDWIN S. CARMAN, INC.

Foundry Engineers and Consultants

LEE RD. AND MAYFIELD—CLEVELAND, OHIO

WHERE-TO-BUY

SAND BLAST BARRELS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Dreisbach Engineering Corp., 45 Warburton Ave., Yonkers, N. Y.
Hougland & Hardy, Inc., Evansville, Ind.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST CABINETS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

SAND BLAST EQUIPMENT
American Air Filter Co., 266 Central Ave., Louisville, Ky.
The American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Ruemelin Mfg. Co., 3850 North Palmer St., Milwaukee, Wis.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST NOZZLES
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Norton Company, Worcester, Mass.
Pangborn Corp., Hagerstown, Md.
Ruemelin Mfg. Co., 3850 N. Palmer St., Milwaukee, Wis.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST ROOMS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.
Ruemelin Mfg. Co., 3850 North Palmer St., Milwaukee, Wis.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND BLAST TABLES
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

SAND CONTROL and TESTING EQUIPMENT
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

SAND CONVEYING and HANDLING EQUIPMENT
American Air Filter Co., 266 Central Ave., Louisville, Ky.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Robins Conveying Belt Co., Passaic, N. J.
Royer Foundry & Machine Co., Kingston, Pa.

SAND CONVEYING and HANDLING EQUIPMENT (Pneumatic)
Fuller Company, Catasaqua, Pa.

SAND DRYERS
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Pangborn Corp., Hagerstown, Md.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

SAND MEASURING and WEIGHING DEVICES
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

SAND MIXERS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

SAND PREPARATION EQUIPMENT
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Clearfield Machine Co., Clearfield, Pa.
Grimes Molding Machine Co., 1429 Virginia Park, Detroit, Mich.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Royer Foundry & Machine Co., Kingston, Pa.
Simplicity Engineering Co., Durand, Mich.

SAND RAMMERS
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Dayton Pneumatic Tool Co., Dayton, O.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.

SAND RECLAIMERS
Hydro-Blast Corp., 3118 N. Clybourne Ave., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

SAND SIFTING and SCREENING MACHINERY
American Air Filter Co., 266 Central Ave., Louisville, Ky.
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago, Ill.
Great Western Mfg. Co., Leavenworth, Kansas.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Royer Foundry & Machine Co., Kingston, Pa.

SAND STORAGE BINS and GATES
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.

SANDING MACHINERY
Delta Mfg. Co., Industrial division, 620 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Company, Grand Rapids, Mich.

SAW (Band, Metal, Wood)
Delta Mfg. Co., Industrial division, 620 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Company, Grand Rapids, Mich.

SAWS (Cold Metal)
Bethlehem Steel Co., Bethlehem, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

SCALING HAMMERS
Dayton Pneumatic Tool Co., Dayton, O.

SCHOOLS (Correspondence)
McLain's System, Inc., Goldsmith Bldg., Milwaukee, Wis.

SCREENS (Shake-Out)
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Robins Conveying Belt Co., Passaic, N. J.
Simplicity Engineering Co., Durand, Mich.

High-Speed Cut-offs with
MANHATTAN ABRASIVE WHEELS

MANHATTAN Abrasive Wheels, made in grains, grades and shapes for a wide variety of applications in cutting-off, grinding or snagging, wear evenly, grind accurately.

To solve special problems in roughing, medium finishing or precision grinding, consult

ABRASIVE WHEEL DEPARTMENT
THE MANHATTAN RUBBER MFG. DIVISION
OF RAYBESTOS-MANHATTAN, INC.
Executive Offices and Factories—77 Townsend St., Passaic, N.J.

FALLS BRAND ALLOYS

★

COPPER ALUMINUM 50/50
COPPER NICKEL 50/50 SHOT
FERRO ALUMINUM 20/80
FERRO ALUMINUM 50/50
FERRO NICKEL 50/50 SHOT OR INGOTS
NICKEL COPPER 70/30 SHOT OR INGOTS
MANGANESE ALUMINUM 25/75
NICKEL ALUMINUM 20/80
SILICON ALUMINUM 50/50
CHROMIUM ALUMINUM 10% CR.
TITANIUM ALUMINUM 5% TI.

In stock for Immediate Shipment

NIAGARA FALLS SMELTING & REFINING CORPORATION
Annual Capacity 43,000,000 Pounds
Head Office, Laboratory & Works, Buffalo, N. Y.

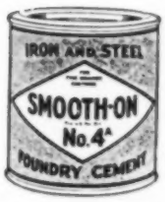
Unsightly Surface Flaws in your castings can be easily corrected

The few castings which come out of your molds with harmless but unsightly surface pits and rough depressions can easily be corrected to perfect contour with Smooth-On No. 4.

Salvaging sound castings in this manner has always been advisable . . . as sound economy. TODAY, it is essential . . . as a war-time necessity.

Smooth-On assures perfect match of texture and color, hardens like iron, and stays put. It is made in three compositions, to offer a choice of color, lustre and texture for any iron or steel casting. Correct selection and application produces a filling which cannot be detected.

For your protection, insist on Smooth-On, used by foundrymen since 1895.



Smooth-On No. 4AA. For light gray castings and machined surfaces. Has high metallic lustre and takes a fine machine finish. Packed in 1-lb., 10-lb., 50-lb.

Smooth-On No. 4A. For medium gray castings. A fine-grained cement that has a good metallic lustre. Packed in 1-lb., 5-lb., 25-lb., 100-lb.

Smooth-On No. 4B. For dark gray castings. A cement of coarser grain and darker shade. Packed in 1-lb., 5-lb., 25-lb., 100-lb.

LEARN SMOOTH-ON BENEFITS *WITHOUT COST*

FREE HARDENED and WORKING **SAMPLES**

Send the coupon for free samples; also free copy of the Smooth-On Repair Handbook, 40 pages of useful hints for repairs to foundry equipment, pipe lines and structures.

— — — — — — — — — — — — —

Smooth-On Mfg. Co., Dept. 17,
570 Communipaw Ave., Jersey City, N. J.

Please send samples of ☐ Smooth-On No. 4AA ☐ Smooth-On No. 4A ☐ Smooth-On No. 4B

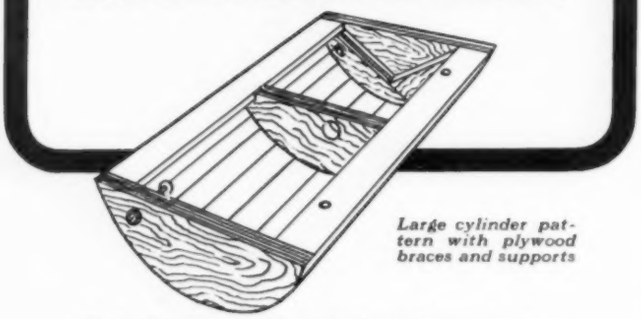
Name

Address

9-42

Do it with **SMOOTH-ON**

Davis Plywood
For PATTERNMAKING



Large cylinder pattern with plywood braces and supports

Each of our three convenient warehouses carries a complete range of sizes and types of plywoods most commonly used for patternmaking, templates and flask and crib construction. Pattern and mold board plywood manufactured to your specifications. Refer to our current catalog. Write for catalog if you do not have a copy.

THE DAVIS PLYWOOD CORP. • 10800 LORAIN AVE. • CLEVELAND, O.

THE DAVIS PLYWOOD CORPORATION
WAREHOUSES
COLUMBUS • CLEVELAND • TOLEDO

BERKSHIRE Jolt Squeeze MOLDING MACHINES

Model H Jolt Squeeze

CANNON AIR VIBRATORS

10" SQUEEZE CYLINDER

4" JOLT CYLINDER

CANNON VIBRATOR CO. • 1111 Power Ave. Cleveland, Ohio • BERKSHIRE MFG. CO.

Let 'Em Help Your Foundry

HAUCK MOLD DRYERS
LADLE HEATERS
CUPOLA LIGHTERS
FURNACE BURNERS

SAVE TIME • FUEL • WORK

Use Hauck Portable Oil Burner Outfits with interchangeable burners for ladle heating and drying, skin drying of molds and cupola lighting. Also hand torches for small molds, cores, etc. Burns kerosene or fuel oil. Our 42 years' experience at your service—write us.

HAUCK MANUFACTURING CO., 106 Tenth St., Brooklyn, N.Y.

WHERE-TO-BUY

SCREENS (Sifting)
Buffalo Wire Works Co., 425 Terrace, Buffalo, N. Y.

SEA COAL
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Midwest Foundry Supply Co., Edwardsville, Ill.
Smith Facing & Supply Co., 1857 Carter Rd., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.

SEPARATORS (Abrasive)
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Pangborn Corp., Hagerstown, Md.

SEPARATORS (Air, Moisture, Oil)
American Air Filter Co., 266 Central Ave., Louisville, Ky.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Jas. A. Murphy & Co., Hamilton, Ohio.
Pangborn Corp., Hagerstown, Md.

SEPARATORS (Magnetic)
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Dings Magnetic Separator Co., 512 E. Smith St., Milwaukee, Wis.
Stearns Magnetic Mfg. Co., 662 S. 28th St., Milwaukee, Wis.

SHAKE-OUT MACHINERY
American Air Filter Co., 266 Central Ave., Louisville, Ky.
C. O. Bartlett & Snow Co., 6201 Harvard Ave., Cleveland, O.
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.
Royer Foundry & Machine Co., Kingston, Pa.
Simplicity Engineering Co., Durand, Mich.

SHOT and GRIT
Alloy Metal Abrasive Co., 311 W. Huron St., Ann Arbor, Mich.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
American Steel Abrasives Co., Galion, O.
Delhi Foundry Sand Co., Cincinnati, Ohio.
Globe Steel Abrasive Co., Mansfield, O.
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hickman-Williams & Co., Cleveland, O.
Pangborn Corp., Hagerstown, Md.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis Sts., Philadelphia, Pa.
Pittsburgh Crushed Steel Co., Pittsburgh, Pa.
Parsons Engineering Co., Cleveland, O.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Steel Shot & Grit Co. Inc., 39 Warren Ave., Boston, Mass.

SHOVELS
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Frederic B. Stevens, Inc., Detroit, Mich.

SILICON—See FERROSILICON and BRIQUETS

SILICA FLOUR
Ottawa Silica Co., Ottawa, Ill.

SILICON (Briquets)
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

SILICON CARBIDE (Briquets)
Carborundum Co., Niagara Falls, N. Y.

SKIMMERS
Tamms Silica Co., 228 N. LaSalle St., Chicago, Ill.

SKIP HOISTS
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
National Engineering Co., 549 W. Washington St., Chicago, Ill.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

SLIP JACKETS
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind
Federal Foundry Supply Co., 4600 E. 71st St., Cleveland, O.
Fremont Flask Co., Fremont, O.

SNAGGING WHEELS—See ABRASIVE WHEELS

SNAP FLASKS
Adams Co., 700 Foster St., Dubuque, Ia.
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.

SODA ASH
Great Lakes Foundry Sand Co., United Artists Bldg., Detroit, Mich.
Hercules Powder Co., 999 Market St., Wilmington, Del.
Mathieson Alkali Works, Inc., 60 E. 42nd St., New York, N. Y.

SPECIAL FOUNDRY ALLOYS
Vanadium Corp. of America, 420 Lexington Ave., New York, N. Y.

SPIEGELEISEN
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York, N. Y.

SPRAYERS (Pistol)
Jas. A. Murphy & Co., Hamilton, Ohio.

SPRAY GUNS
Jas. A. Murphy & Co., Hamilton, Ohio.

SPRUE CUTTERS
Freeman Supply Co., Toledo, O.
Scully Machinery & Equip. Corp., 2031 W. 74th St., Chicago, Ill.

STAMPS & HOLDERS (Steel)
M. E. Cunningham Co., 97 E. Carson St., Pittsburgh, Pa.

STARS (Tumbling)
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.

STEEL (High Speed)
Bethlehem Steel Co., Bethlehem, Pa.

STEEL (Structural)
American Bridge Co., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.

STEEL WASH
Dayton Oil Co., Dayton, O.

STOKERS
American Engineering Co., 2418 Aramingo Ave., Philadelphia, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

STRIPPING MACHINES
Champion Foundry & Machine Co., 1314 West 21st St., Chicago, Ill.
Davenport Machine & Foundry Co., Davenport, Iowa.
International Molding Machine Co., 2608 W. 16th St., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.

TANK TRAPS
Jas. A. Murphy & Co., Hamilton, Ohio.

TESTING LABORATORIES
Harry W. Dietert Co., 9330A Roselawn Ave., Detroit, Mich.
Chas. C. Kawin Co., 431 So. Dearborn St., Chicago, Ill.

TIMERS (Electric)
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.

TONGS
Industrial Equipment Co., Minster, O.

TOOLS (Pneumatic, Portable)
Chicago Pneumatic Tool Co., General Offices: 8 East 44th St., New York.
Cleveland Pneumatic Tool Co., 3734 East 78th St., Cleveland, O.
Dayton Pneumatic Tool Co., Dayton, O.
Gardner-Denver Co., Gardner Drive, Quincy, Ill.
Ingersoll-Rand Co., 11 Broadway, New York, N. Y.

—When writing advertisers, please mention THE FOUNDRY—

At Left—Ingersoll Plain Back Strap Pattern Moulders' Shovel with Wooden "D" Handle.
In Center—Ingersoll Solid Shank Pattern Moulders' Shovel with Tubular Split "D" Handle.
At Right—Ingersoll Hollow Back Pattern Scoop with Wood Split "D" Handle.

PEIN HANDLES
Ingersoll Foundry Shovels also available with any of these Handles at slight extra cost

Tubular "D" with Wood Pein Grip | Malleable Top with Rubber Pein Grip | Malleable One-Piece "D" with Pein Tamping Top | Fenton Aluminum "D" with replaceable Rubber Pein

PAY NO MORE
to Get this EXTRA VALUE in FOUNDRY SHOVELS

EDGES GUARANTEED SPLIT-PROOF

In our own mills, we roll the TEM-CROSS Tillage Steel from which the blades of Ingersoll Shovels are made. Our cross-rolling process gives this steel an interlocking, mesh-grain structure. That's why we can guarantee . . . "Blade Edges are Split-proof."

Ingersoll Plain Back and Hollow Back Shovels and Scoops can be obtained in either of the four Standard Grades . . . Alloy, A, B or C. A Solid Shank Moulders' Shovel is available only in Alloy, A and B Grades.

Write us direct, giving name of your Jobber or present source of Shovel supply. Address our New Castle Plant, Dept. F.

INGERSOLL STEEL & DISC DIVISION
BORG-WARNER CORPORATION
NEW CASTLE, INDIANA
Plants: New Castle, Ind.; Chicago, Ill.; Kalamazoo, Mich.

INGERSOLL FOUNDRY *Shovels*

"THE BORG-WARNER LINE"

FOR GRAY IRON FOUNDRIES

Gray Cast Iron

By John W. Bolton

A COMPLETE DISCUSSION IN ONE VOLUME ON THE SUBJECT OF GRAY CAST IRON

■ Presents the basic metallurgical principles involved in the manufacture of gray iron to modern engineering specifications.

Its 22 chapters discuss such phases as melting processes, casting defects, design, effects of regular and alloying elements, superheating, heat treatment, physical properties, machinability and wear, effect of temperature on mechanical properties, corrosion, and specifications.

383 Pages, 262 Illustrations, Diagrams, Charts & Tables

PRICE, POSTPAID $5.00

THE PENTON PUBLISHING CO.
Book Department
Penton Building **Cleveland, Ohio**
301F

READY TO MEET ALL CHALLENGES

HERE'S AN ACE BLAST CLEANING NOZZLE THAT WILL FIGHT FOR YOU TO THE LIMIT OF HIS EXTRAORDINARY LONG LIFE. ONCE ON YOUR SIDE YOU CANNOT LOSE. BETTER ENLIST HIM NOW FOR THE DURATION!

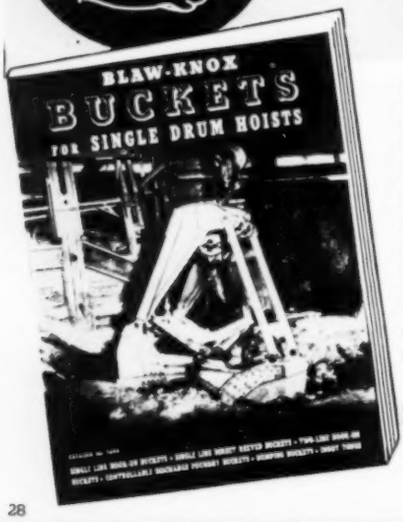
GUARANTEED 1500 HOURS WITH STEEL ABRASIVES
750 HOURS WITH SAND

* Trade Mark of Norton Co. for Boron Carbide

PANGBORN CORPORATION
The World's Largest Manufacturer of Blast Cleaning and Dust Collecting Equipment
HAGERSTOWN . . . . MARYLAND

FOR FOUNDRY BUCKETS SEE

NEW BLAW-KNOX CATALOG 1696



Describes and illustrates all types of hook-on buckets for foundry service to to be used on foundry cranes, monorails, derricks or similar rigs. Can be hooked on or off in a jiffy. Write for your copy today.

BLAW-KNOX DIVISION
of Blaw-Knox Company
Farmers Bank Bldg
Pittsburgh, Pa.

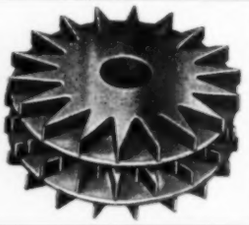
28

BLAW-KNOX
BUCKETS

Grinding Wheel Dressers

■ We manufacture the only complete line of dressers and cutters. Write for copy of catalog "F" and name of your nearest dealer.

DESMOND-STEPHAN MFG. CO.
Urbana, Ohio
Canadian D. S. Mfg. Co., Hamilton, Ont.



PRODUCERS
CORE SAND
CORPORATION
PITS AT
MICHIGAN CITY, INDIANA
AND SAWYER, MICHIGAN
MICHIGAN CITY, INDIANA

SEMI-STEEL
IS THE LINK

between iron and steel—is 25 to 60% stronger—no blow holes, sponginess or defects—is clean, close-grained, machines easily, etc. ARE YOU MAKING IT? It stood test since 1902 of few hundred tons to millions now yearly.

COKE SAVINGS WILL BE DEMANDED—are you ready? Get our report on YOUR cupola, the advice is applicable to all shops, concise,—correspondence feature is optional. Get our system of mixing, melting and semi-steel. Synopsis FREE.

McLAIN'S SYSTEM INC.
803 Goldsmith Bldg. Milwaukee, Wis.

WHERE-TO-BUY

TOOLS (Tungsten, Titanium, Carbide Tipped)
McKenna Metals Co., 131 Lloyd Ave., Latrobe, Pa.

TORCHES and BURNERS (Acetylene, gas, oil)
Freeman Supply Co., Toledo, O.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

TRAMRAIL SYSTEMS
American MonoRail Co., 13104 Athens Ave., Cleveland, O.
Chicago Tramrail Co., 2910 Carroll Ave., Chicago, Ill.
Cleveland Tramrail Div. of Cleveland Crane & Engineering Co., 1155 East 283rd St., Wickliffe, O.
Modern Equipment Co., Dept. 194, Port Washington, Wis.

TRIPOLI
Barnsdall Tripoli Co., Seneca, Mo.

TROLLEYS
Curtis Pneumatic Machinery Co., 1922 Kienlen Ave., St. Louis, Mo.
Modern Equipment Co., Dept. 194, Port Washington, Wis.

TRUCK WHEELS
Bethlehem Steel Co., Bethlehem, Pa.
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

TUBES (X-Ray)
Picker X-Ray Corp., 300 Fourth Ave., New York City.

TUMBLING BARRELS
Cleveland Chaplet & Mfg. Co., W. 67th St. and N.Y.C. Ry., Cleveland, O.
N. Ransohoff Inc., 208 W. 71st St., Cincinnati, O.
W. W. Sly Mfg. Co., 4753 Train Ave., Cleveland, O.
Tabor Mfg. Co. 6225 Tacony St., Philadelphia, Pa.
Whiting Corp., 15607 Lathrop Ave., Harvey, Ill.

TURNTABLES
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.
Modern Equipment Co., Dept. 194, Port Washington, Wis.
Whiting Corporation, 15607 Lathrop Ave., Harvey, Ill.

VALVES, AIR
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.

VALVES (Air, Water, Steam)
Air-Way Pump & Equipment Co., 405 S. Jefferson St., Chicago, Ill.
Galland-Henning Mfg. Co., 2750 So. 31st St., Milwaukee, Wis.
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

VALVES (Adjustable Orifice)
North American Mfg. Co., 2910 E. 75th St., Cleveland, O.

VALVES (Blow-off and Cut-off)
Champion Foundry & Machine Co., 1314 W. 21st St., Chicago, Ill.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.

VENTILATING SYSTEMS
American Foundry Equipment Co., 505 S. Byrkit St., Mishawaka, Ind.
Claude B. Schneible Co., 3953 Lawrence Ave., Chicago, Ill.
Cleveland Blow Pipe & Mfg. Co., 6505 Cedar Ave., Cleveland, Ohio.
Industrial Sheet Metal Wks., 325 E. Forest Ave., Detroit, Mich.
Pangborn Corp., Hagerstown, Md.
Parsons Engineering Co., Cleveland, O.

VENTS (Core Box)
Wm. Demmler & Bros., Kewanee, Ill.
C. M. Smillie & Co., 1100 Woodward Hgts. Blvd., Ferndale, Mich.

VIBRATORS
Beardsley & Piper Co., The, 2541 N. Keeler Ave., Chicago, Ill.

VIBRATORS (Cont'd.)
Cannon Vibrator Co., 1111 Power Ave., Cleveland, O.
Davenport Machine & Foundry Co., Davenport, Iowa.
Foundry Supplies & Mfg. Co., 2221 Orchard St., Chicago, Ill.
Herman Pneumatic Machine Co., Union Bank Bldg., Pittsburgh, Pa.
Link Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Milwaukee Foundry Equipment Co., 3238 W. Pierce St., Milwaukee, Wis.
New Haven Vibrator Co., 131 Chestnut St., New Haven, Conn.
Wm. H. Nicholls Co., Richmond Hill, Long Island, N. Y.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.
Peerless Tools Inc., Milford, Conn.
Pennsylvania Foundry Supply & Sand Co., Ashland & E. Lewis St., Philadelphia, Pa.
S P O Incorporated, 7500 Grand Division Ave., Cleveland, O.
Syntron Company, Homer City, Pa.
Tabor Mfg. Co., 6225 Tacony St., Philadelphia, Pa.

WASHFOUNTAINS
Bradley Washfountain Co., 2217 W. Michigan St., Milwaukee, Wis.

WAX (Core, Vent, Pattern)
United Compound Co., Inc., 328 South Park Ave., Buffalo, N. Y.

WEDGES (Foundry)
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

WELDING GAS
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

WELDING (Acetylene Generators)
Sight Feed Generator Co., Richmond, Ind.

WELDING APPARATUS (Electric Arc)
Sight Feed Generator Co., Richmond, Ind.

WELDING and CUTTING APPARATUS and SUPPLIES
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

WELDING ROD
Air Reduction Sales Co., 60 East 42nd St., New York, N. Y.
Eutectic Welding Alloys Inc., 40 Worth St., New York, N. Y.
National Cylinder Gas Co., 205 W. Wacker Drive, Chicago, Ill.

WHEELBARROWS
Sterling Wheelbarrow Co., 7100 W. Walker St., Milwaukee, Wis.

WHEELS (Cut-off)
West Co. Inc., 1117 Shackamaxon St., Philadelphia, Pa.

WHEELS (Wire)
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

WIRE BRUSHES
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, O.

WIRE CLOTH
Buffalo Wire Works Co., 425 Terrace, Buffalo, N. Y.

WIRE NAILS
Bethlehem Steel Co., Bethlehem, Pa.

WIRE ROPE
American Cable Division of American Chain & Cable Co., Inc., Wilkesbarre, Pa.
Hazard Wire Rope Division of American Chain & Cable Co., Inc., Wilkesbarre, Pa.

WOODWORKING MACHINERY
Delta Mfg. Co., Industrial division, 620 E. Vienna Ave., Milwaukee, Wis.
Oliver Machinery Co., Grand Rapids, Mich.

X-RAY EQUIPMENT
General Electric X-Ray Corp., 2012 Jackson Blvd., Chicago, Ill.

X-RAY FILMS
Picker X-Ray Corp., 300 Fourth Ave., New York City.

—When writing advertisers, please mention THE FOUNDRY—

Classified Advertising

Positions Wanted

CHEMIST

Specializing in nonferrous metals. Technical investigation and development of special purpose alloys. Experienced analyst with working knowledge of physical chemistry principles. Desires connection where abilities can have full play; and with post-war prospects. Draft exempt. Address Box 791, The FOUNDRY, Cleveland.

EXPERIENCED FOUNDRYMAN

Offers 20 years' experience in selling and demonstrating supplies, equipment, binders specialty. Moderate salary. No commission. Address Box 758, The FOUNDRY, Cleveland.

BRASS AND ALUMINUM FOREMAN

With 32 years' experience desires a position. Experienced in making matchplates, patterns for production, jobbing work. Understands piece work, mixing metals, making cores. References. Now employed as foreman. Address Box 792, The FOUNDRY, Cleveland.

METALLURGICAL CHEMIST

With years of experience in iron, steel, aircraft materials, seeks responsible position. Age 34, married, American born. B. S. degree. Address Box 789, The FOUNDRY, Cleveland.

FOREMAN, PATTERNMAKER, TROUBLE SHOOTER

With 29 years' experience in foundry work desires a position. Capable of handling men, and any type of metal, including magnesium. Can estimate and mold in any kind of foundry. Capable of contacting customers on patterns and castings. American. Wants a responsible position. Address Box 794, The FOUNDRY, Cleveland.

MECHANICAL ENGINEER

Age 36, graduate. Thirteen years' experience in all phases of steel mill and foundry plant engineering and maintenance. Desires position as Plant Engineer with progressive company in East. Now employed. Minimum salary $6000. Address Box 752, The FOUNDRY, Cleveland.

FOUNDRY FOREMAN

Desires position in brass or magnesium foundry. Seventeen years' experience as molder on jobbing and production work. Can rig and produce, good handler of men. Address Box 783, The FOUNDRY, Cleveland.

Employment Service

SALARIED POSITIONS

$2,500 to $25,000

This advertising service of 32 years' recognized standing negotiates for positions of calibre indicated. Procedure individualized to your personal requirements. Retaining fee protected by refund provision. Identity covered. If salary has been $2,500 or more send for details.

R. W. BIXBY, INC.
101 Delward Bldg. Buffalo, N. Y.

Employment Service

GRAY IRON FOUNDRY EMPLOYMENT

We are receiving many inquiries for superintendents, metallurgists and foremen. We shall be glad to hear from qualified men. No charge.

Gray Iron Founders' Society Inc.
1010 Public Square Building Cleveland, Ohio

Wanted-To-Buy

WANTED AT ONCE

1—250 pound to one ton electric melting furnace. Address inquiries stating full particulars to **Hi-Alloy Castings Company, P. O. Box 193, New Brighton, Pa.**

WANTED

Tumbling Barrel about 3' x 6' size.

The Cooper Alloy Foundry Co.,
Bloy St. & Ramsey Ave.,
Hillside, N. J.

WE WANT TO PLACE ORDERS

For bronze rods of various specifications, sizes ⅛", ⅜", ¼", ⅝" diameter, length 12" to 18". Foundries having experience in casting rods, write in detail. Address Box 776, The FOUNDRY, Cleveland.

WANTED TO BUY

1300 to 1500 air compressor, or enough compressors to make 1500 ft. air. Also 150 KW 2300—250 V motor generator.

WANTED TANKS

12—10,000 gal. cap. or larger tanks to total 120,000 gal. cap.

RUSSELL STANHOPE,
Darien, Conn.

MIXERS WANTED

Used Simpson Intensive Sand Mixers. State size, condition and lowest cash price for immediate acceptance. Address Box 578, The FOUNDRY, Cleveland.

For Sale

FOR SALE

60 sets mall. flasks, 13 x 18—4" C. & D.
5-175 lb. aluminum gas fired furnaces
1—Type "K"-84" American sand cutter, Buda motor
1—20" Davenport jolt stripper
2—16" x 5" draw hand rollovers
2—No. 112 Milwaukee jolt squeeze strip
3—No. 11-32 Nichols jolt squeeze strip
4—Arcade "Modern" squeezers
31—Hand strippers, round or square

CHAMPION FOUNDRY & MACHINE CO.
1314 West 21st St. Chicago, Ill.

REBUILT COMPRESSORS AND BLOWERS

1250 CFM, @ 3¼ lbs., 3600 RPM Gen. Elec. with 30 H.P. A.C. motor drive.

(3) Buffalo Forge Pressure Blowers, 1200 cfm @ 11 oz., 9½" inlet, 7 x 7 outlet, driven by 7½ H.P. A.C. Motors.

450 CFM, 3500 RPM Gen. Elec. with 6.2 H.P A.C. motor drive.

SAND VIBRATOR

Jeffery-Traylor, shaker type CVS-8, 6" wide hand deck, capacity 7 to 8 tons sand per hour; with 15 cycle, 110 volt, single phase vibrator motor generator set. Write, wire or phone.

The Motor Repair & Mfg. Co.
1552 Hamilton Ave. Cleveland, Ohio

REBUILT
BLOWERS—FANS—EXHAUSTERS

Roots-Connersville positive cupola blowers. Centrifugal blowers for gas and oil burning. Sand blast, grinder and dust exhausters. Ventilating fans.

GENERAL BLOWER COMPANY
406 N. Peoria St. Chicago, Illinois

AIR COMPRESSORS

BELTED—176 ft., 355 ft., 540 ft., 676 ft., 752 ft. & 1300 ft.

ELECTRIC—355 ft., 528 ft., 676 ft., 807 ft., 1302 ft., 1723 ft., 2022 ft., 2200 ft., 2800 ft., 3600 ft., & 5000 ft.

STEAM—368 ft., 500 ft., 800 ft., 1221 ft., 1640 ft., 2200 ft., & 3000 ft.

DIESEL—368 ft., 603 ft., 900 ft. & 1300 ft.

GASOLINE—110, 160, 220, 310, 1300 ft.

R. C. STANHOPE, INC.
60 East 42nd St. New York, N. Y.

Classified Advertising

For Sale

FOR SALE

1 P. H. & F. M. Roots Company blower, Serial No. 39223—Size 3.

For further information inquire:

EASTERN MALLEABLE IRON COMPANY
Wilmington, Delaware

FOR SALE

One No. 6 Piqua positive pressure blower, 20" x 60"—35 ft. displ. top discharge, mounted on bed-plate direct connected to 40 h.p. Wagner 3/60/220 A. C. motor, with starter used.

Address Box 760, The FOUNDRY, Cleveland.

EQUIPMENT IN STOCK
GUARANTEED IMMEDIATE SHIPMENT
MOLDING MACHINES

(1)—No. 81 Osborn Jolt Squeeze Stripper
(1)—20" Tabor Jarr Rollover.

MISCELLANEOUS ITEMS

(1)—Young Bros. Gas Fired Core Oven, 12'6" deep x 8' wide x 7'6" high, double doors one end, 4" insulation complete with burner, flues and pyrometer.
(1)—Coleman Junior No. 2 Core Oven 5-drawers, 42" wide, height 6" and 7".
(1)—1¾" cap. Shuster Power Sprue Cutter.
(4)—Large Flask Vibrators.
(1)—10-H.P. Black & Decker, double end 230-VDC. Grinder, capacity 24" wheels.

AIR COMPRESSORS & BLOWERS

(1)—12 x 12 Chicago N.S.B. 375-CFM. @ 100 lbs. with idler, unloader and lubricator.
(1)—12 x 10 Penna. 365-CFM. & 100 lbs. belt drive, 60-HP. C.W. slip ring motor, 220/3/60-cycle.
(1)—No. 4 Wil. Green Positive Pressure cap. 13-cu. ft. per rev.
(1)—Spencer Turbo Blower, 1300-CFM. @ 16-oz. 10-HP. motor, 220/3/60-cy., 1760-RPM.

SAND HANDLING EQUIPMENT

(1)—No. 3 Simpson Sand Mixer with gear reduction and 50-HP. motor.
(1)—Link Belt 24" x 55" hopper type, Core Buster used with belt conveyor.
(1)—Link-Belt Vibrating Screen 22½" x 50" used with belt conveyor shake out system.

MELTING EQUIPMENT

(1)—350 lb. Detroit Electric Furnace complete with 100-KVA, 2300 volt transformer, two boxes electrodes (used six months).
(2)—3500 lb., 6000 lb. Ladles, worm geared, crane type bail, (excellent condition).

ELECTRIC MONORAIL HOISTS

(30)—½ to 5-ton, 1 and 2 motor, Fl. and Cage operated, 220/440-volts, 3-PH, 60-CY. 110 and 230-VDC.

OVERHEAD ELECTRIC TRAVELING CRANES

(1) to 50-tons cap. 18'0" to 91'0" span, 220/440-volts, A.C. and 230-VDC. We operate the largest crane rebuilding Plant in the country. Send us your specifications for Cranes, Electric Monorail Hoists, Crane Motors, Standard Motors, Steel Buildings and Runways. We can quote you on equipment rebuilt to your specifications.

T. B. MacCABE CO.
4304 CLARISSA ST. PHILADELPHIA, PA.

For Sale

Are **YOU** in need of foundry equipment?

Do **YOU** have equipment to sell?

Are **YOU** looking for experienced men?

Do **YOU** want to obtain a position?

If **"Yes"** is your answer to any of the above questions, may we offer the services of the Classified Advertising Department of The FOUNDRY? For rates write *today* to:

The FOUNDRY

Classified Advertising Department

Penton Building **Cleveland**

REBUILT USED EQUIPMENT

Molding machines, all types; tumbling mills; furnaces; cupolas; air compressors; hoists; rammers, all types; ladles, all types; sand mixers; sand blast tanks; core machines, etc. All equipment rebuilt and guaranteed. All sizes used steel flasks.

HAYNES FOUNDRY EQUIPMENT COMPANY
1734 Lake St. **Kalamazoo, Mich.**

FOR SALE

Herman rollover and bumper, size 60 x 72. **The Cooper-Bessemer Corporation, Mount Vernon, O.**

FOR SALE

One bottom dumping sand bucket with a capacity of 2½ tons; made by Link-Belt; used two years, in excellent condition. **Grand Rapids Foundry, 548 Bond Avenue, N. W., Grand Rapids, Michigan.**

For Sale

FOR SALE

1 Green positive blower with 50 h.p. motor, dust collector unit, molding machine, electric welder, 50 h.p. motor 900 r.p.m. Write for complete list.

E. A. MEYER
Green Bay, Wisconsin

FOR SALE

(1) 3-ton Heroult furnace complete except for controls and transformer.
(2) 1000 lb. Detroit rocking type electric furnace complete with 300 KVA 4600 volt transformer and panel board.

Address Box 671, The FOUNDRY, Cleveland.

SPECIAL DEFENSE BARGAINS

Air Receivers up to 42" dia.

60" Cupola stack sections only.

Air Compressor Unit—8½ x 12 Worthington Vee Belt drive with receiver, starter unloader etc. complete unit. 40 HP 3-60-220 motor.

Fans—Blowers—Exhausters for cooling, ventilation, dust or fumes removal.

Fan or **Centrifugal** style blowers—Maxon-Premax—from No. 0 to No. 4. Spencer Turbine, Am. Blower Co., Sturtevant, Buffalo, Clarage, Buffalo, etc. for Gas or Oil fuel Combustion.

Rotary Pressure Blowers—Roots-Connersville, Garden City, Green, Piqua, Sturtevant, Am. Gas Furnace Co. etc. Send specifications.

Furnaces for Brass and Aluminum Melting—2—No. 2 U. S. Rotary Melting Furnaces. Normal capacities increased 50% in lengthened melting chambers.

Hausfeld Tilting open flame 400 lb. brass cap. Booth Electric 725 lb. brass cap. with instruments. Stationary Furnaces, swing top for crucibles No. 60 to No. 150 and open top for iron pots up to 300 lb. aluminum.

Schwartz Furnace—42". Class A unlined.

Molding Machines—Osborn No. 404-S, Pit Type jolt-stripper. "Berkshire" 34" wide stationary air squeeze. "Tabor" 8" cyl. air squeeze. "Battenfeld" (Johnston & Jennings) stationary jolt squeeze; 5 in stock. Adams—Stationary hand squeezers 48" wide 2 in stock. Mumford—Stationary Air Squeeze 14 x 18" platen. Tabor—Hand operated, portable, Rollover, draw for 24" x 30" flasks or core boxes, 2 in stock.

1—Crane Ladle 4 tons capacity.

1—25 H.P. Diesel Engine, horizontal.

1—Paxson 36" x 60" Round Tumbling mill.

Sand Blasts—pressure generator tanks with hose & nozzles. Sly wet Cinder mill.

Sand Blast Barrel—New Haven 36 x 36" for Motor direct connected without motor.

Sand Blast Table—Pangborn 8' dia. with operators room and pressure generator tank.

Tell us your needs.

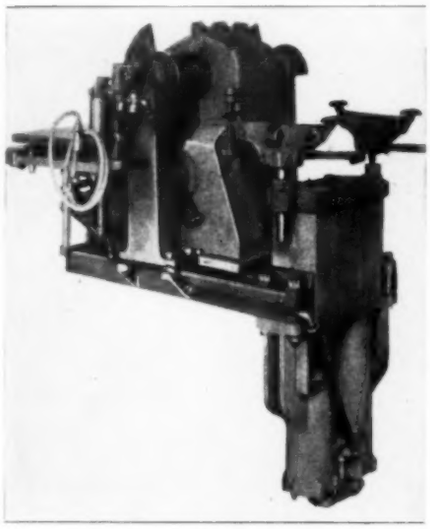
CLIFTON MACHINERY CO.
1023 W. 6th, CINCINNATI, O.

SCULLY Reconditioned Foundry Equipment

★ ALL SCULLY EQUIPMENT IS REBUILT AND OVERHAULED IN OUR OWN, NEW MACHINE SHOP

INTERNATIONAL MOLDING MACHINES

1 49 x 16" draw Type "F," fitted with air equalizers, rollers in the draw section and hand operated core box clamps, jar plate 100" long, 6000 lbs. cap.



INTERNATIONAL TYPE "F"
(Enclosed Model)

48 x 16" draw Type "F"—4200 lbs. cap. @ 80 lbs., table size 48 x 83".

36 x 16" Type "F" (double cyl. open type) 3000 lbs. cap. @ 80 lbs. press. 36 x 48" table.

31 x 16" Type "F" late type enclosed cyl. machine, 28 x 52" roll-over table, 2500 lbs. capacity.

27 x 16" draw Type "F" (enclosed cyl. model) 27 x 34" table, 1600 lbs. cap. @ 80 lbs. pressure.

MILWAUKEE MOLDING MACHINES

Milwaukee No. 113 Jolt Squeeze Strip, portable, 500 lbs. cap. @ 80 lbs. press., 6" pattern draw, 16 x 26" table, jolt cyl. 5"—squeeze cyl. 11".

Milwaukee No. 113, same as above, excepting open end type, instead of closed end.

GRIMES—MILWAUKEE

Grimes Model K-614 roll-over, 6" cyl. 1000 lbs. cap. @ 80 lbs. max. width of flask 32" max. length 48"—14" pattern draw.

No. 832 Milwaukee hand jolt and roll-over, foot draw, portable, 30" height pattern table, max. draw 8" 15 x 32" table.

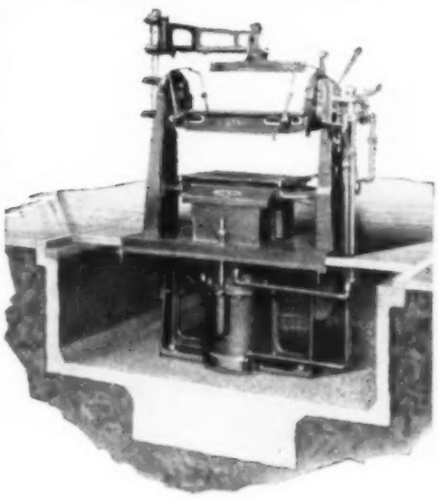
JOLT SQUEEZE & STRIP POWER

No. 142 Milwaukee, stationary, stripping cap. 1200 lbs. @ 80 lbs. press., draw 6" table 19 x 35"—open end type.

No. 703-6 Osborn jolt squeeze and strip, 21 x 28" table, stationary, length of opening in lifting frame 34", 6" pattern draw, 8" cyl. dia. 1000 lbs. jolt. cap. @ 80 lbs. pressure, distance from lifting frame to squeeze head 24¼", flask length 44½", with roll off conveyor.

No. 703-5 Osborn, same as above excepting 17 x 35" table.

OSBORN Molding Machines



No. 332, jolt roll-over and squeeze with roller conveyor attachment, flask cap., max. length 36" width 26" pattern draw 9"—750 lbs. cap. @ 80 lbs.

No. 333, flask cap. max. length 45" width 32" —pattern draw 11", 1400 lbs. cap. @ 80 lbs. press. squeeze cyl. dia. 19".

No. 513-E Osborn Air Jolt and Electric Roll-Over, pattern draw and Run-Out Car, flask length O/A 124" width 72" capacity, width of roll-over table 60"—pattern draw 30"—cap. @ 80 lbs. pressure 12,000 lbs. with 15 HP Motor.

MISC. MOLDING MACHINES

No. 403-W Osborn jolt roll-over and pattern draw, flask cap. 52 x 36", 12" draw, with swing-out Mold Table, Power Roll-Over.

Osborn No. 404 roll-over jolt, flask cap. 40 x 54"—15" draw, 1500 lbs. cap. @ 80 lbs.—with run-out Mold Car.

Herman 40 x 60" Independent turn-over and pattern drawing device, 48 x 58" Bumper.

No. 24 Davenport jolt roll-over draw, stationary, table 24 x 38", 10" draw, 1000 lbs. cap. @ 80 lbs. press.

Tabor 24" hand ram, power roll-over and hand draw, portable, 20 x 30" table, 9" draw, 500 lbs. cap. @ 80 lbs.

EXHAUST TUMBLING BARRELS

Sly 30" dia. x 50" long 9/16" plate, 18 x 22" door opening.

24" dia. x 48" long, ⅝" plate renewable trunnions.

34" dia. x 74" long ¾" plate Whiting, renewable trunnions.

36" dia. x 72" long Sly, ⅜" plate renewable trunnions complete with 5 HP 3/60/220V AC Motor.

40" dia. x 72" long ¾" plate, door opening entire length, renewable trunnions, pulley drive.

OVERHEAD ELECTRIC TRAVELING CRANES

Whiting BUCKET HANDLING DOUBLE DRUM CRANE 4-motor type, cage operated, 230V DC Motors, Drum Type Cont. 18'8" span, 7'0" track gauge, end trucks 15'0" wheel base.

3-ton MILWAUKEE 3-motor Type "C" GANTRY CRANE (suitable for 5-tons) 230V DC Motors, lattice type girders, 31'6" span, 25 ft. lift, overhang on each side approx. 12 ft., single drum parallel with bridge girders.

35-ton Morgan, 36 ft. span Power House Type 4-motors, 600V DC Motors, with Aux. Hoist.

25-ton Walker 55 ft. span with 5-ton Aux. 550V DC Motors, girders single web const. truck ends with large steel wheels, chain on main drum, 3-motors.

15-ton Whiting 3-motors, 37 ft. span, 3/60/440V AC Motors, 25 ft. lift, floor operated, drum type cont. structural steel truck sections.

5-ton Armington 26' 6" span, 2-motor type, 220V AC Motors, floor operated, 18" "I" Beams, trolley hand racked.

5-ton Shepard Class "B" 18'5" span, 1-motor, floor control, 6 HP 220V DC, trolley hand racked, bridge hand racked.

2-ton Detroit Ice House Type, 26 ft. span, "I" Beam Bridge Type Girders, 3-motors, 3/60/220V AC, floor oper. 10 ft. lift.

ELECTRIC HOISTS

1-ton Sprague Type S-1, equipped with 220V AC Motor, floor operated, 10 ft. lift (can arrange for Trolley or Top Hook)

2000 lbs. Northern with Hand Racked Trolley, 2 HP Wagner 11T BP 3/60/220V AC 960 RPM Motor, floor control.

2000 lb. Shepard Lift-A-Bout Form I.S. equipped with Trolley, 2¼ HP Zobell Elec. 110V DC 1100 RPM Motor, floor oper. 18 ft. lift, speed 20 FPM.

2000 lb. Shepard 2-motor 115V DC, Trolley motor 2 HP 925 RPM, Hoisting motor 4 HP—15 ft. lift, speed 15 FPM.

3-ton P & H Type M-3, with motorized trolley. Motors 220V DC, 20 ft. lift, speed 20 FPM.

5-6 tons Detroit equipped with Watson 6½ HP 230V 1300 RPM DC Motor, floor control, can arrange for either Top Hook or Trolley, as required.

5-ton Shepard Form 1 Class B-6, equipped with 6 HP 115V DC Motor, floor operated, speed 15 FPM, 20 ft. lift, can arrange for Top Hook or Trolley, as required.

PLEASE NOTE:
To avoid delay, please address inquiries to our NEW office and warehouse.

SCULLY MACHINERY & EQUIPMENT CORP.
(Formerly – Foundry Division of Scully-Jones & Co.)
2031 WEST 74th STREET (Phone PROspect 8770) CHICAGO, ILLINOIS

Index to Advertisers

Acme Pattern & Tool Co., Inc. 189
Adams Co. 10, 11
Air Reduction 12
Air-Way Pump & Equipment Co. 192
Ajax Metal Co. 160
Alloy Metal Abrasive Co. 197
American Air Filter Co., Inc. 42
American Brass Co. The 103
American Bridge Co. 176
American Chain & Cable Co., Inc., Wright Manufacturing Div. 187
American Engineering Co. 131
American Foundry Equipment Co., The 70, 71, 141
American Gum Products Co. 191
American Monorail Co., The 111
American Optical Co. 16

Bartlett, C. O., & Snow Co. 29
Bay State Abrasive Products Co. 45
Beardsley & Piper Co., The 34, 35
Berkshire Mfg. Co. 202
Bethlehem Steel Co. 1
Blaw-Knox Div. of Blaw-Knox Co. 204
Bradley Washfountain Co. 168
Brooke, E. & G., Iron Co., The 187
Buehler, Adolph I. 150
Buell Engineering Co., Inc. 18
Buffalo Wire Works Co., Inc. 189

Campbell-Hausfeld Co., The 164
Cannon Vibrator Co. 202
Carborundum Co., The 60
Carl-Mayer Corp., The 125
Carman, Edwin S., Inc. 200
Certified Core Oil & Mfg. Co. 101
Champion Foundry & Machine Co. 8, 9
Chicago Pneumatic Tool Co. 26
Chicago Rawhide Mfg. Co. 197
Chicago Tramrail Co. 149
Clearfield Machine Co. 51
Cleveland Flow Pipe & Mfg. Co. 163
Cleveland Chaplet & Mfg. Co. 188
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 49
Cleveland Pneumatic Tool Co. 68
Cleveland Quarries Co., The 179
Climax Molybdenum Co. 99
Columbia Steel Co. 176
Combined Supply & Equipment Co., Inc. 194
Conco Engineering Works 170
Crucible Manufacturers Association 112
Cunningham, M. E., Co. 198

Davenport Machine & Foundry Co. 13
Davis Plywood Corp., The 202
Dayton Oil Co. 159
Dayton Pneumatic Tool Co. 182
Delhi Foundry Sand Co. 189
Delta Manufacturing Co. 181
Delta Oil Products Co. 61
Demmler, Wm., & Bros. 157, 198
Desmond-Stephan Mfg. Co. 204
Despatch Oven Co. 27
Detroit Electric Furnace Division Kuhlman Electric Co. 146
Diamond Clamp & Flask Co. 40
Dietert, Harry W., Co. 183
Dougherty Lumber Co. 109

Eastern Clay Products, Inc. 52
Electric Furnace Co., The 2
Electro-Chemical Pattern & Mfg. Co. 200
Electro Metallurgical Co. 25
Electro Refractories & Alloys Corp. 50
Farner Manufacturing Co., The 38
Federal Foundry Supply Co., The Front Cover, 135
Fisher Furnace Co. 19
Foundry Equipment Co., The 22, 23
Foundry Services, Inc. 174
Foundry Supplies Manufacturing Co. 44
Fox Grinders, Inc. 187
Fremont Flask Co. 172
Fuller Company 142

Gardner-Denver Co. 48
Great Lakes Foundry Sand Co. 17
Gehnrich Corporation, The 158
General Blower Co. 200
General Electric X-Ray Corp. 66, 67
Globe Iron Co. 198
Globe Steel Abrasive Co. 179
Great Western Mfg. Co. 190
Grimes Molding Machine Sales 166

Hauck Manufacturing Co. 202
Haws Refractories Co. 183
Hercules Powder Co., Inc. 95
Herman Pneumatic Machine Co. 62
Hickman, Williams & Co. 169
Hydro-Blast Corp. 14, 15

Illinois Clay Products Company 154
Illinois Testing Laboratories, Inc. 205
Imperial Belting Co. 148
Industrial Equipment Co. 183
Industrial Gloves Co. 205
Industrial Sheet Metal Works 153
Ingersoll Steel & Disc Division, Borg-Warner Corp. 203
International Molding Machine Co. 119
International Nickel Co., Inc., The 93
International Paper Co. 185

Jackson Iron & Steel Co., The 184
Jefferson Machine Tool Co. 192
Johns-Manville 165
Johnston & Jennings Co., The 53

Kawin, Chas. C., Co. 156
Kelley-Koett Mfg. Co. 55
Koch, George, Sons, Inc. 167

Lanly Co., The 171
Lindberg Engineering Co. 31
Link-Belt Co. Back Cover

McCormick, J. S., Co. 147
McLain's System, Inc. 204

Macklin Co. 20
Maehler, Paul, Co., The 161
Mahon, R. C., Co. 63
Mahr Mfg. Co., Div. Diamond Iron Works, Inc. 65
Mall Tool Co. 197
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc. 201
Marathon Chemical Co. Div. of Marathon Paper Mills Co. 133
Mathews Conveyer Co. 115
Mathieson Alkali Works (Inc.) Inside Front Cover
Midwest Foundry Supply Co. 173
Milwaukee Chaplet & Mfg. Co. 162
Modern Equipment Co. 212
Moline Iron Works 178
Molybdenum Corp. of America 120
Murphy, James A., & Co. 180

National Cylinder Gas Co. 127
National Engineering Co. 30
New Haven Vibrator Co. 186
Niagara Falls Smelting & Refining Corp. 201
Nicholls, Wm. H., Co., Inc. 56
Norton Co. 32

Ohio Ferro-Alloys Corp. 43
Oliver Machinery Co. 179
One Piece Chaplet Co. 205
Osborn Manufacturing Co., The 105, 106

Pangborn Corporation 6, 7, 145, 203
Parsons Engineering Corp. 211
Peerless Tools, Inc. 205
Penn Iron Works 194
Penola Inc. 39
Penton Publishing Co., Book Dept. 137
Pfaff, George, Inc. 186
Pickands Mather & Co. 59
Pioneer Mfg. Co. 170
Pittsburgh Crushed Steel Co. 193
Plaster Process Castings Co. 190
Pollard Oil Products Co. 184
Porbeck Manufacturing Co. 193
Producers Core Sand Corp. 204
Pulmosan Safety Equipment Corp. 175

Radium Chemical Co., Inc. 181
Ramtite Co., The 69
Ransohoff, N., Inc. 24
Republic Steel Corp. 72
Rietz Lumber Co. 185
Robeson Process Co. 191
Royer Foundry & Machine Co. 37
Ruemelin Mfg. Co. 172

Safety Grinding Wheel & Machine Co. 57
Schneible, Claude B., Co. 21
Schramm, Inc. 152
Scientific Cast Products Corp., The 186
Scully Machinery & Equipment Corp. 117, 184, 209
Sight Feed Generator Co. 188
Simonds Worden White Co. 185
Simplicity Engineering Co. 182
Sly, W. W., Mfg. Co., The 122, 123
Smillie, C. M., & Co. 188
Smith, Werner G., Co., The 4, 5
Smooth-On Manufacturing Co. 201
SFO, Inc. 58
Standard Conveyor Co. 143
Staynew Filter Corp. 46
Steel Shot & Grit Co. 193
Sterling Grinding Wheel Co., The 128
Sterling Wheelbarrow Co. 64
Stevens, Frederic B., Inc. Inside Back Cover
Stroman Furnace & Engineering Co. 173
Swindell-Dressler Corp. 47
Syntron Co. 191

Tabor Manufacturing Co. 41
Tamms Silica Co. 175
Tannewitz Works, The 155
Thomas & Proetz Lumber Co. 194
Titanium Alloy Mfg. Co. 54
Truscon Steel Co. 151

Union Carbide & Carbon Corp. 35
United Compound Co. 176
United States Electrical Tool Co., The 190
United States Graphite Co. 33
U. S. Steel Corporation and Subsidiaries 176
U. S. Steel Export Co. 176

Vanadium Corp. of America 28
Vonnegut Moulder Corp. 144
Vulcan Corporation 191

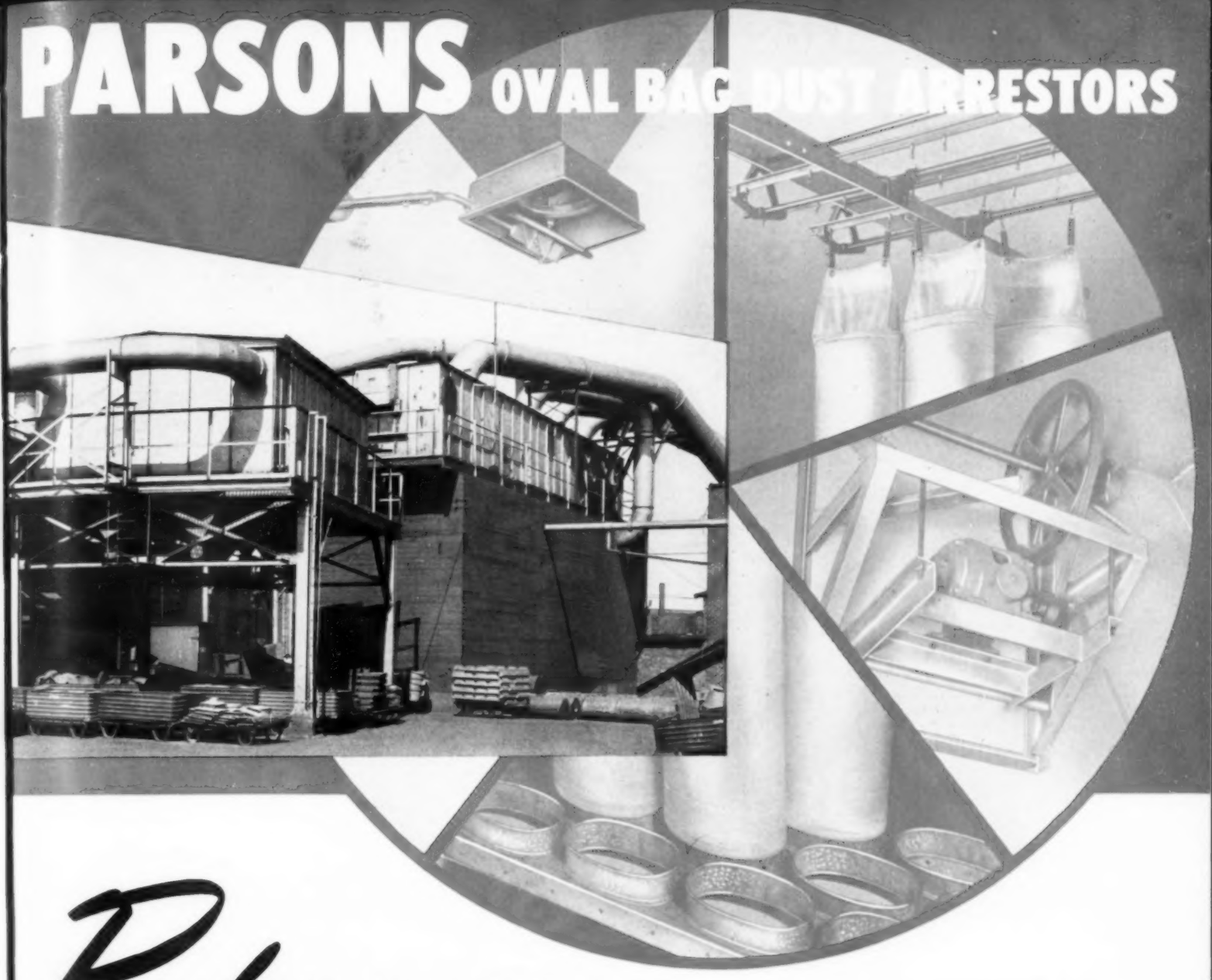
Wellman Engineering Co. 205
West Co., The 193
Wickland, A. A., & Co. 192
Woodward Iron Co. 97
Wright Manufacturing Division, American Chain & Cable Co., Inc. 187

Table of Contents, Page 3

Refer to alphabetical list of products in "Where-To-Buy" pages, beginning on Page 177

Classified Advertisers, Pages 206, 207, 208, 209

PARSONS OVAL BAG DUST ARRESTORS



Performance IN DUST CONTROL

IS MORE THAN SKIN DEEP

IT'S what's under the skin of any piece of equipment that counts in performance and efficiency. In Parsons Oval Bag Dust Arrestors you find exclusive engineering features that have earned their stripes on sheer performance and efficiency in every-day use under all kinds of conditions.

Patented Oval filtering bags combine all advantages of envelope and cylindrical types, no metal contacts the cloth.

Non-rusting arrestor case, maintenance and inspection on clean air side, instant spotting of leaks.

Simple texrope drive, balanced eccentric mechanism operating rocker type bag, shaking device 100% discharge.

Heavy duty welded hoppers discharged by non-clogging rubber-sealed hopper valves absolutely dust tight.

These are just a few of the many exclusive features that go to make Parsons Oval Bag Dust Arrestors the talk of the trade and the choice of the buyers who know that the best is the cheapest in the long run. Send for free booklet on "Mastery Of The Air."

PARSONS *Engineering* CORP.

2545 EAST 79TH STREET • CLEVELAND, OHIO

METAL POURING ACES *a-la Modern*

Point The Way To Industrial Victory

Cupolas — Cupola Chargers — Covered & Insulated Ladles — Lifetime Geared Ladles —
Improved Bottom Pour Ladles — Metal Pouring Systems — Crane & Monorail Systems
For Metal & Mold Handling — Furnace Charging Cranes — Electric Mold Skin Driers

MODERN EQUIPMENT COMPANY

PORT WASHINGTON, WISCONSIN

MODERN EQUIPMENT CO.
PORT WASHINGTON, WIS.

What DO YOU NEED for faster production of better castings

Stevens will make prompt shipment on orders for these facing mill products.

vens East India Ceylon Plumbago—same ades—same quality—as you've been ac-tomed to using on peace-time jobs, are ducing scrap losses and high cleaning room ts on castings for war production. Each grade Stevens Plumbago spreads smoothly, gives ximum coverage, provides ample protection ainst the fusing action of metal and assures a ooth finish. We will gladly recommend the ht grade for your type of work.

Stevens Core Wash—Several grades of Stevens Core Wash have made their identifying numbers famous among foundrymen. Numbers 110, 114 and 114-A are as popular with their respective users as numbers 115, 180-D and Stevens Carbon Blacking. Stevens Core Washes—at a wide range of Baumes—can be applied by dipping, spraying, or brushing. They mix easily, stay in suspension, do not ferment, and are highly heat resistant.

Stevens Parting Compounds—Choose one of these widely used Parting Compounds. Columbia a creamy-white tripoli parting is a perfect separator on both hot and cold sand. Sno-White, containing less than ½ of 1% silica, spreads and covers well; is easly seen. Mol-Dust works well on molds for aluminum and malleable iron castings. Stevens Liquid is the most popular parting for use on metal pattern plates.

g Kore Kompound—This uniform, black core mpound is higher in bonding strength than linary pitch compounds. It is used in cores for , steel, malleable, and aluminum castings—ll, medium and large. Cores, in which a ll quantity of King Kore Kompound is used, not absorb moisture, bake out fast, and apse quickly when metal shrinks.

Stevens Core Paste—Made in three grades, each highly adhesive and quick acting. High Temperature Core Paste is particularly adapted for pasting cores that are to be set in the mold several hours before pouring. Stevens No. 3 Core Paste is an extra fast air-drying grade. Improved Core Paste is red in color, thus, easy to see.

Stevens Seacoal Facing—Stevens Seacoal, jet black in color, is carefully ground and uniformly screened. All coarse particles which might cause coke pits on castings are removed. Especially high in volatile matter, Stevens Seacoal prevents sand from fusing to the casting. Stevens Seacoal definitely improves casting finish. Let us submit a grade for your approval.

★ ★ ★ ★ ★ ★

Stevens Facings excel wherever the going is tough

FREDERIC B. STEVENS, INC.

Detroit, Michigan

- NEW ENGLAND . . . . 166-182 Brewery St., New Haven, Conn.
- NEW YORK and PENNSYLVANIA . . 93 Stone St., Buffalo, N. Y.
- INDIANA . Hoosier Supply Co., 36 S. Cruse St., Indianapolis, Ind.
- CANADA . . Frederic B. Stevens of Canada, Limited
- 1262 McDougall St. . . . . Windsor, Ontario
- 2368 Dundas St. West . . . . . Toronto, Ontario

★ LET US HELP YOU ★

★ *"Keep the Wheels Turning"* ★

ON THE PRODUCTION FRONT

CONVEYING—ELEVATING

There are many types of conveying equipment available today and it is important that the correct type be used for each application. Link-Belt makes them all—belt, trolley, screw, chain, apron, flight, bucket, platform and mold conveyors, skip hoists, feeders, etc. —all products of over a half century of experience in the engineering and manufacturing of equipment of this kind. A nation-wide staff of engineers is at your service.

MECHANICAL POWER TRANSMISSION

The maintenance of your mechanical power transmission equipment, in A-1 running order, is all important to maximum production efficiency. Link-Belt transmission experts, with a complete line of mounted and unmounted ball and roller and babbitted bearing units, clutches, couplings, collars, sprockets, shafting, etc., are ready and anxious to assist you.

SAND SCREENING, MIXING, AERATING

Whether your problem is complex or simple, be sure and call on Link-Belt for help. Years of experience in the application and manufacture of a complete line of all types of screening, aerating, mixing and riddling equipment assure successful installations.

MECHANICAL SHAKEOUT

The Link-Belt Vibro-Shakeout centralizes and speeds up this operation. It also saves sand because of better cleaning—eliminates damage to flasks—improves working conditions and greatly reduces operator fatigue. We also manufacture air and mechanical jolting devices.

LINK-BELT

FOR UNITY FOR VICTORY

● With industry on the offensive, all goes well only as long as your equipment is holding up . . . for the Nation's life depends on the productivity of its plant equipment.

Constant vigilance and an extra measure of lubrication, cleaning and adjustment will ward off breakdowns — conserve replacement parts—save priceless production time.

Call on Link-Belt for material handling, sand preparation and mechanical power transmission equipment service.

●

LINK-BELT COMPANY

Chicago Indianapolis Philadelphia
Atlanta Dallas San Francisco
Cedar Rapids Toronto

Offices, warehouses and distributors in principal cities

6885-C

POWER DRIVES

Slipping drives are a menace to machine efficiency. Link-Belt chain drives (silent, roller, steel, malleable, and other types) cannot slip . . . engagement of chain and sprockets is positive . . . no frictional contacts . . . no lost R.P.M. . . . full machine efficiency is maintained at all times. Let a Link-Belt positive drive specialist help solve your drive problems.

SPEED REDUCTION SPEED CONTROL

Top performance requires the exact type and size unit that will fit your application. Making three types of gear reduction units—herringbone, worm and motorized—and two types of variable speed units—the P.I.V. Gear and V.R.D. units—Link-Belt can and will give you authoritative and unbiased counsel. Send for helpful engineering data books.

SAND RECLAMATION AND CONDITIONING

Effective, scientific sand conditioning and preparation are economically accomplished with Link-Belt standardized units, engineered to fit specific conditions. Link-Belt designs offer maximum flexibility, efficiency and economy of layout.

DRYING AND COOLING

If you wish to cut costs and improve core and molding sand drying operations, eliminate obsolete methods, save on heat and maintenance, you will be interested in the unique features of the Roto-Louvre dryer-cooler as described in special catalog and engineering data book No. 1911. It contains valuable information on the subject.

LINK-BELT

LET'S GO! U.S.A. · KEEP 'EM FLYING